

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Brake Caliper Bleeder Screw	12 N·m	106 lb in
Brake Caliper Bracket Bolt - Front (JH5)	175 N·m	129 lb ft
Brake Caliper Bracket Bolt - Front (JH6, JH7)	300 N·m	221 lb ft
Brake Caliper Bracket Bolt - Rear With Dual Rear Wheel	300 N·m	221 lb ft
Brake Caliper Bracket Bolt - Rear With Single Rear Wheel (JH5)	200 N·m	148 lb ft
Brake Caliper Bracket Bolt - Rear With Single Rear Wheel (JH6, JH7)	165 N·m	123 lb ft
Brake Caliper Guide Pin Bolt - Front	108 N·m	80 lb ft
Brake Caliper Guide Pin Bolt - Rear With Dual Rear Wheel	61 N·m	45 lb ft
Brake Caliper Guide Pin Bolt - Rear With Single Rear Wheel (JH5)	34 N·m	25 lb ft
Brake Caliper Guide Pin Bolt - Rear With Single Rear Wheel (JH6, JH7)	72 N·m	53 lb ft
Brake Hose Fitting Bolt - Front	44 N·m	32 lb ft
Brake Hose Fitting Bolt - Rear With Dual Rear Wheel	40 N·m	30 lb ft
Brake Hose Fitting Bolt - Rear With Single Rear Wheel	44 N·m	32 lb ft
Brake Shield Nut - Dual Rear Wheel	160 N·m + 30 degrees	118 lb ft + 30 degrees
Brake Shield Nut - Single Rear Wheel	135 N·m	100 lb ft
Front Hub Extension Nut	130 N·m	96 lb ft

Disc Brake Component Specifications

Application	Specification	
	Metric	English
Front Brake JH5		
Rotor Discard Thickness *	27.50 mm	1.083 in
Rotor Minimum Allowable Thickness After Refinish	28.0 mm	1.102 in
Rotor Thickness New	29.0 mm	1.142 in
Rotor Maximum Allowable Lateral Runout	0.13 mm	0.005 in
Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
Rotor Maximum Allowable Thickness Variation	0.025 mm	0.001 in
Front Brake JH6		
Rotor Discard Thickness *	36.50 mm	1.437 in
Rotor Minimum Allowable Thickness After Refinish	37.0 mm	1.457 in
Rotor Thickness New	38.0 mm	1.496 in
Rotor Maximum Allowable Lateral Runout	0.13 mm	0.005 in
Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
Rotor Maximum Allowable Thickness Variation	0.025 mm	0.001 in
Front Brake JH7		
Rotor Discard Thickness *	36.50 mm	1.437 in
Rotor Minimum Allowable Thickness After Refinish	37.0 mm	1.457 in
Rotor Thickness New	38.0 mm	1.496 in
Rotor Maximum Allowable Lateral Runout	0.13 mm	0.005 in
Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
Rotor Maximum Allowable Thickness Variation	0.025 mm	0.001 in
Rear Brake JH5		
Rotor Discard Thickness *	28.50 mm	1.122 in
Rotor Minimum Allowable Thickness After Refinish	29.0 mm	1.142 in
Rotor Thickness New	30.0 mm	1.181 in
Rotor Maximum Allowable Lateral Runout	0.13 mm	0.005 in
Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
Rotor Maximum Allowable Thickness Variation	0.025 mm	0.001 in
Rear Brake JH6		
Rotor Discard Thickness *	27.50 mm	1.083 in
Rotor Minimum Allowable Thickness After Refinish	28.0 mm	1.102 in
Rotor Thickness New	29.0 mm	1.142 in
Rotor Maximum Allowable Lateral Runout	0.13 mm	0.005 in
Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
Rotor Maximum Allowable Thickness Variation	0.025 mm	0.001 in

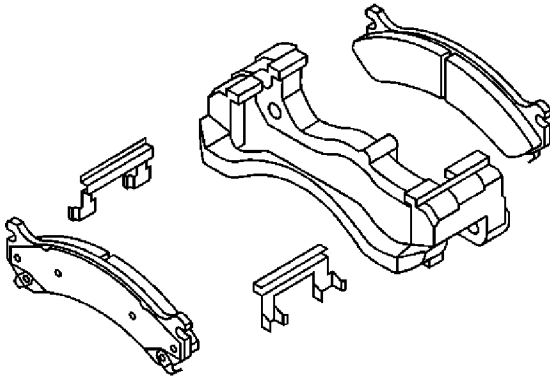
Rear Brake JH7		
Rotor Discard Thickness *	28.5 mm	1.122 in
Rotor Minimum Allowable Thickness After Refinish	29.0 mm	1.142 in
Rotor Thickness New	30.0 mm	1.181 in
Rotor Maximum Allowable Lateral Runout	0.13 mm	0.005 in
Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
Rotor Maximum Allowable Thickness Variation	0.025 mm	0.001 in
* All brake rotors have a discard dimension cast into them. Replace any rotor that does not meet this specification. After refinishing the rotor, replace any rotor that does not meet the minimum thickness specifications.		

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Front Disc Brake Pads Replacement

Removal Procedure

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

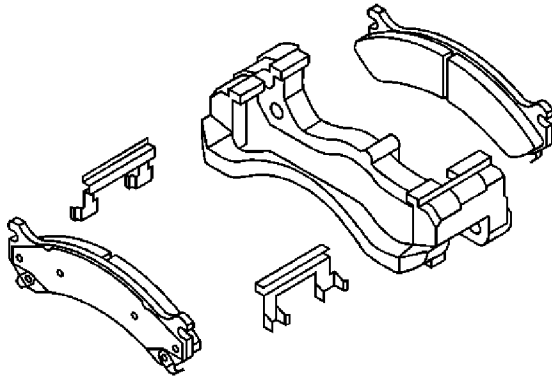


1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
5. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
6. Inspect the caliper operation. Refer to [Brake Caliper Inspection](#).

Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

7. Remove the caliper from the mounting bracket and support the caliper with heavy mechanic wire or equivalent. DO NOT disconnect the hydraulic brake flexible hose from the caliper. Refer to [Front Brake Caliper Replacement](#).
8. Remove the brake pads from the caliper mounting bracket.
9. Remove and discard the anti-rattle clips from the brake caliper mounting bracket.
10. Inspect the caliper and mounting bracket. Refer to [Brake Caliper Inspection](#).

Installation Procedure



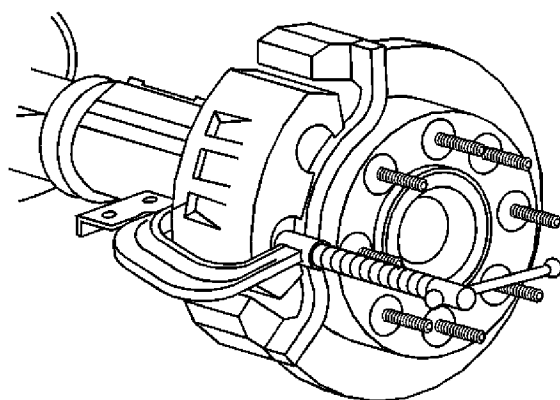
1. Install new anti-rattle clips to the inside ends of the caliper mounting bracket.
2. Install the brake pads to the caliper mounting bracket.
3. Place the new pads in the same orientation as noted during removal.
4. Install the brake caliper. Refer to [Front Brake Caliper Replacement](#).
5. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
6. Remove the safety stands.
7. Lower the vehicle.
8. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
9. Slowly release the brake pedal.
10. Wait 15 seconds, then repeat steps 8-9 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
11. Fill the master cylinder reservoir to the proper level with clean brake fluid. Refer to [Master Cylinder Reservoir Filling](#).
12. Burnish the brake pads and rotors. Refer to [Brake Pad and Rotor Burnishing](#).

Rear Disc Brake Pads Replacement (With Single Rear Wheel)

Removal Procedure

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Caution: Refer to [Brake Fluid Effects on Paint and Electrical Components Caution](#) in the Preface section.



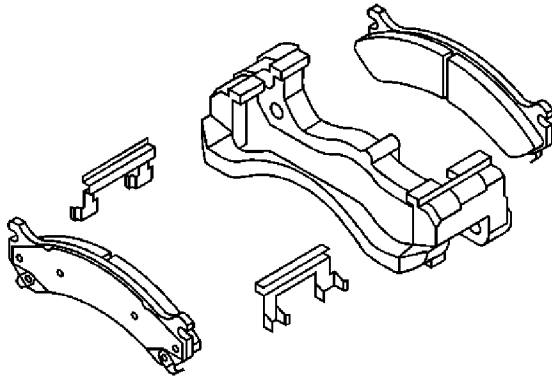
1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and suitably support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
5. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
6. Inspect the caliper operation. Refer to [Brake Caliper Inspection](#).
7. Place a C-clamp as shown. Slowly bottom the pistons of the caliper. It may be necessary to reposition the C-clamp to allow both of the pistons to bottom into the caliper bores.

Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

8. Remove the caliper from the mounting bracket and support the caliper with heavy mechanic's wire or equivalent. DO NOT disconnect the hydraulic brake flexible hose from the caliper.

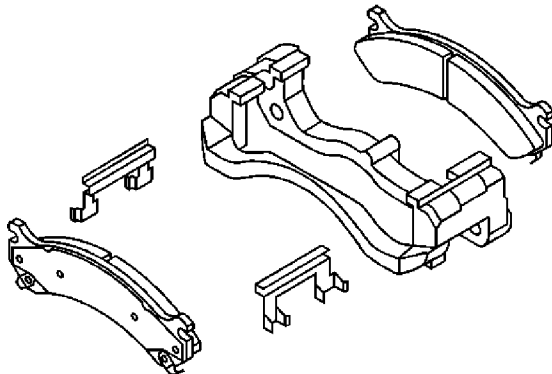
Refer to [Rear Brake Caliper Replacement](#).

9. Inspect the caliper assembly. Refer to [Brake Caliper Inspection](#).



10. Remove the brake pads from the brake caliper bracket. Note the orientation.
11. Remove and discard the anti-rattle clips from the brake caliper mounting bracket.

Installation Procedure



1. Install the anti-rattle clips to the brake caliper bracket.
2. Install the brake caliper. Refer to [Rear Brake Caliper Replacement](#).
3. Install the brake pads to the brake caliper bracket. Place the new pads in the same orientation as noted during removal.
4. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
5. Lower the vehicle.

6. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
7. Slowly release the brake pedal.
8. Wait 15 seconds, then repeat steps 6-7 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
9. Fill the master cylinder reservoir to the proper level with clean brake fluid. Refer to [Master Cylinder Reservoir Filling](#).
10. Burnish the brakes pads and rotors as necessary. Refer to [Brake Pad and Rotor Burnishing](#).

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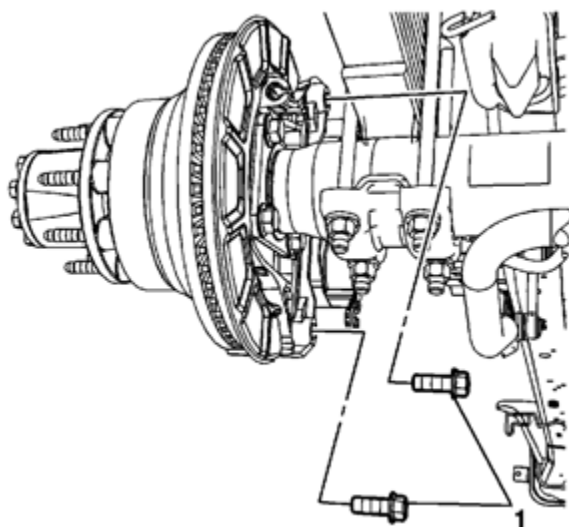
Rear Disc Brake Pads Replacement (With Dual Rear Wheel)

Removal Procedure

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

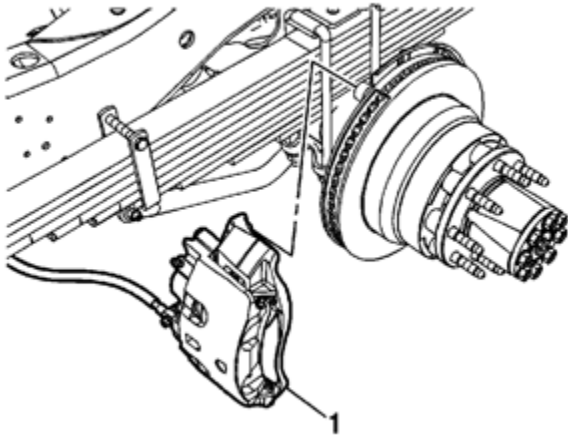
1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
5. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
6. Position a large C-clamp against the outboard disc brake pad backing plate and over the rear of the brake caliper body.
7. Using the C-clamp, slowly and evenly bottom the brake caliper pistons into the brake caliper bores.

Note: Do not remove the brake caliper guide pins unless replacement is required.

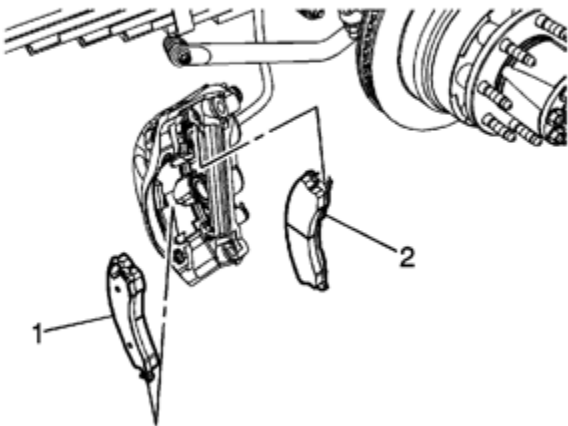


8. Remove the brake caliper bracket bolts (1).

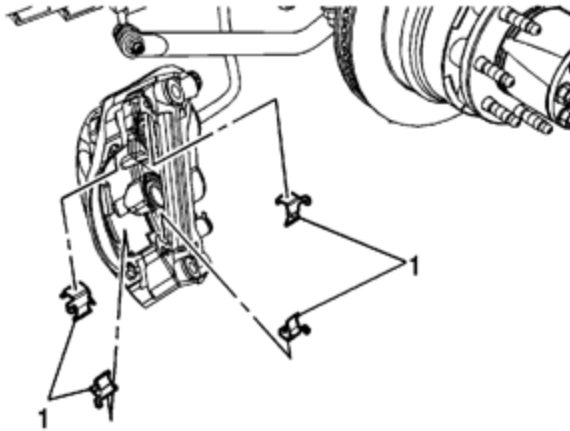
Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.



9. Remove the brake caliper and bracket assembly (1) and support with heavy mechanics wire or equivalent.

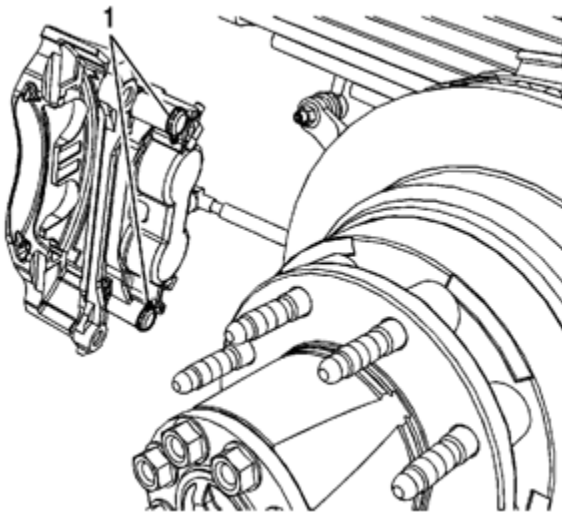


10. Remove the outer brake pad (1).
11. Remove the inner brake pad (2).



12. Remove the brake pad springs (1).
13. Clean the brake pad springs contact areas of the brake caliper bracket of any accumulated corrosion and debris.

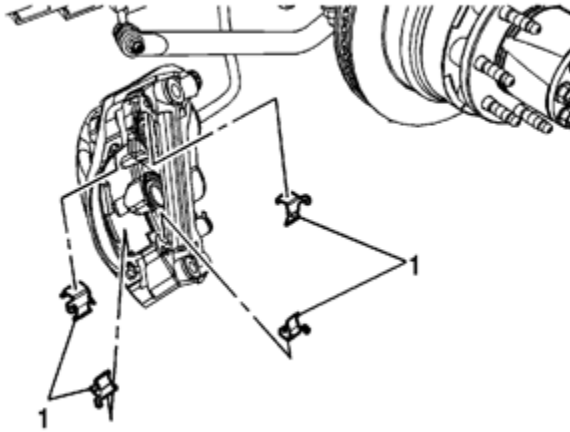
Installation Procedure



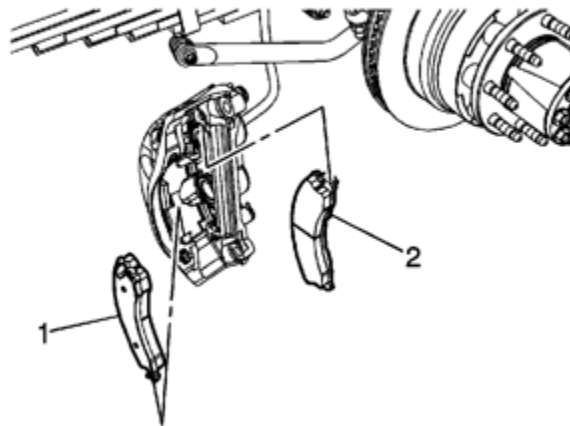
1. Ensure the brake caliper guide pin caps (1) are in good condition and firmly seated on the brake caliper body.

Replace any missing or damaged brake caliper guide pin caps.

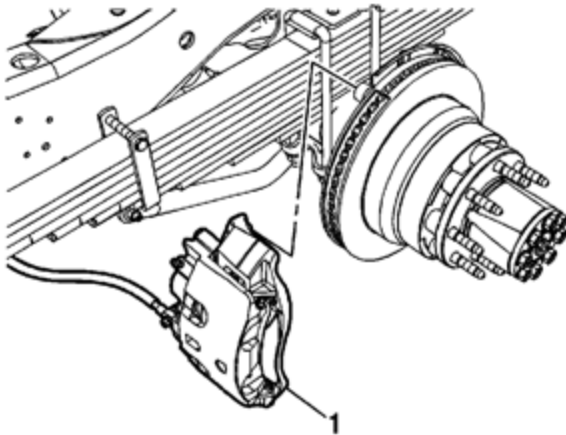
2. Without disengaging the brake caliper from the brake caliper guide pins, inspect the brake caliper hardware. Refer to [Rear Disc Brake Mounting and Hardware Inspection](#).



3. Install the brake pad springs (1).

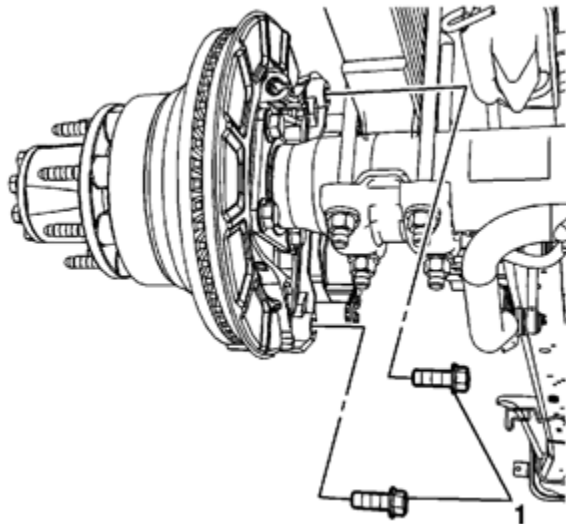


4. Install the outer brake pad (1).
5. Install the inner brake pad (2).
6. Prepare the brake caliper bracket bolts and the rear axle threaded holes for assembly.
 - Clean the brake caliper bracket bolts of any threadlocking residue
 - Clean the rear axle threaded holes of any threadlocking residue with denatured alcohol and allow to dry
7. Apply threadlocker GM P/N 89021297 (Canadian P/N 10953488) to 2/3 of the threaded length of the brake caliper bracket bolt.
8. Allow the threadlocker to cure approximately 10 minutes before assembly.



9. Position the brake caliper and bracket assembly (1) to the rear axle.

Caution: Refer to [Fastener Caution](#) in the Preface section.



10. Install the brake caliper bracket bolts (1) and tighten to **300N·m (221 lb ft)**.
11. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
12. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
13. Slowly release the brake pedal.
14. Wait 15 seconds, then repeat steps 14-15 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
15. Fill the brake master cylinder. Refer to [Master Cylinder Reservoir Filling](#).

16. Burnish the brake pads and rotors. Refer to [Brake Pad and Rotor Burnishing](#).

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Brake Pad and Rotor Burnishing

Warning: Road test a vehicle under safe conditions and while obeying all traffic laws. Do not attempt any maneuvers that could jeopardize vehicle control. Failure to adhere to these precautions could lead to serious personal injury and vehicle damage.

Burnishing the brake pads and brake rotors is necessary in order to ensure that the braking surfaces are properly prepared after service has been performed on the disc brake system.

This procedure should be performed whenever the disc brake rotors have been refinished or replaced, and/or whenever the disc brake pads have been replaced.

1. Select a smooth road with little or no traffic.
2. Accelerate the vehicle to 48 km/h (30 mph).

Note: Use care to avoid overheating the brakes while performing this step.

3. Using moderate to firm pressure, apply the brakes to bring the vehicle to a stop. Do not allow the brakes to lock.
4. Repeat steps 2 and 3 until approximately 20 stops have been completed. Allow sufficient cooling periods between stops in order to properly burnish the brake pads and rotors.

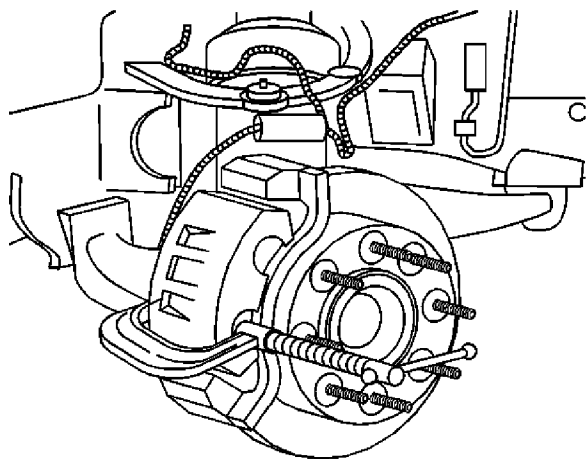
Front Brake Caliper Replacement

Removal Procedure

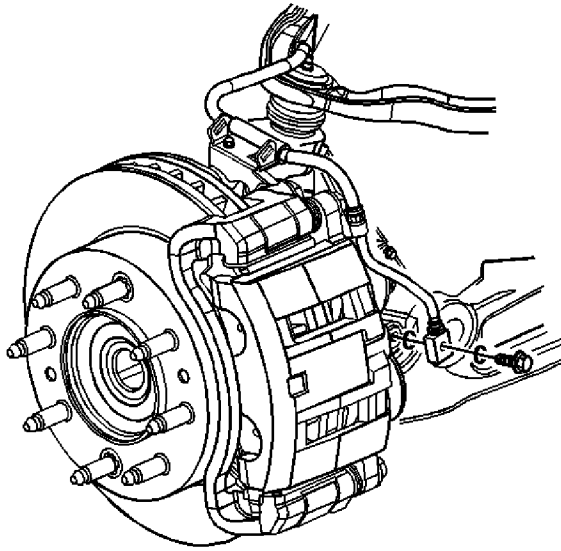
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Warning: Refer to [Brake Fluid Irritant Warning](#) in the Preface section.

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
5. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).

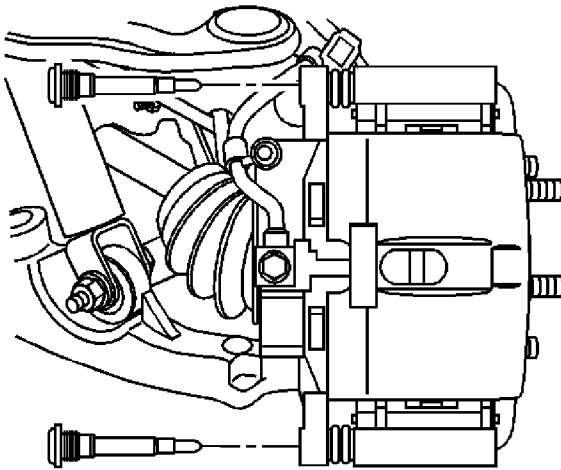


6. Compress the brake caliper pistons.
 - Install a large C-clamp over the top of the caliper housing and against the back of the outboard pad.
 - Slowly tighten the C-clamp until the pistons are pushed completely into the caliper bores.
 - Remove the C-clamp from the caliper.
7. Clean all dirt and foreign material from the brake hose end.



Note: Install a rubber cap or plug to the exposed brake pipe fitting end to prevent brake fluid loss and contamination.

8. Remove the brake hose to caliper bolt from the brake caliper.
9. Remove and discard the 2 copper brake hose gaskets. These gaskets may be stuck to the brake caliper housing or the brake hose end.
10. Remove the brake hose from the caliper.

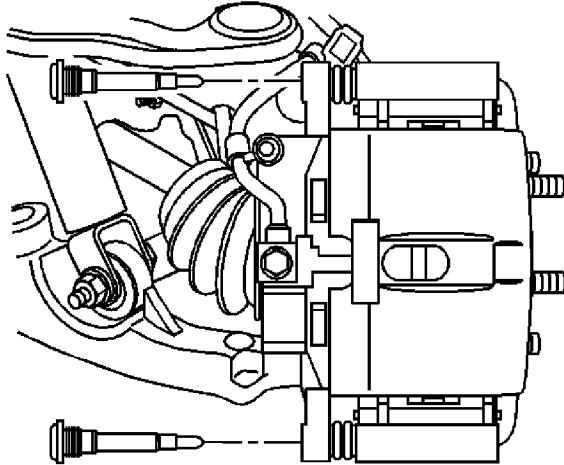


11. Remove the 2 brake caliper mounting bolts.

Warning: Do not depress the brake pedal with the brake rotors/calipers and/or the brake drums removed. Damage to the brake system may result. If brake system damage occurs and is not repaired, vehicle damage and/or personal injury or death may result.

12. Remove the brake caliper from the brake caliper mounting bracket.

Installation Procedure



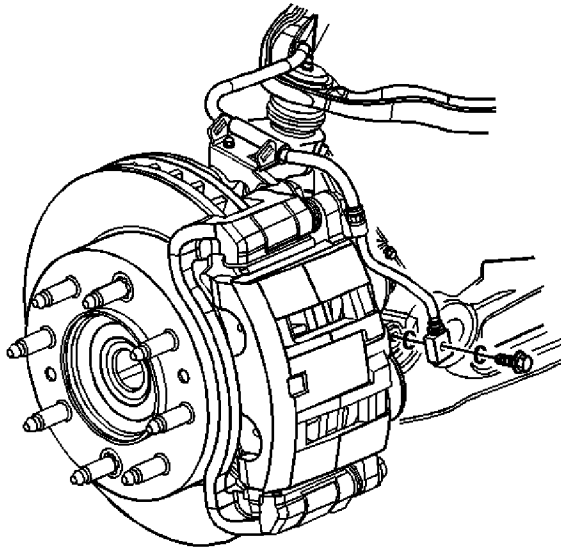
1. Install the brake caliper to the brake caliper mounting bracket.
2. Perform the following procedure before installing the caliper mounting bolts.
 - 2.1. Remove all traces of the original adhesive patch.
 - 2.2. Clean the threads of the bolt with brake parts cleaner or the equivalent and allow to dry.
 - 2.3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488) to the threads of the bolt.

Caution: Refer to [Fastener Caution](#) in the Preface section.

3. Install the 2 brake caliper mounting bolts and tighten to **108 N·m (80 lb ft)**.
4. Remove the rubber cap or plug from the exposed brake hose fitting end.

Note: Install 2 new copper brake hose gaskets.

5. Assemble the 2 new copper brake hose gaskets and the brake hose to caliper bolt to the brake hose.



6. Install the brake hose to caliper bolt to the brake caliper and tighten to **44 N·m (32 lb ft)**.
7. Bleed the hydraulic brake system. Refer to [Hydraulic Brake System Bleeding](#).
8. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
9. Lower the vehicle.
10. Fill the master cylinder reservoir to the proper level with clean brake fluid. Refer to [Master Cylinder Reservoir Filling](#).

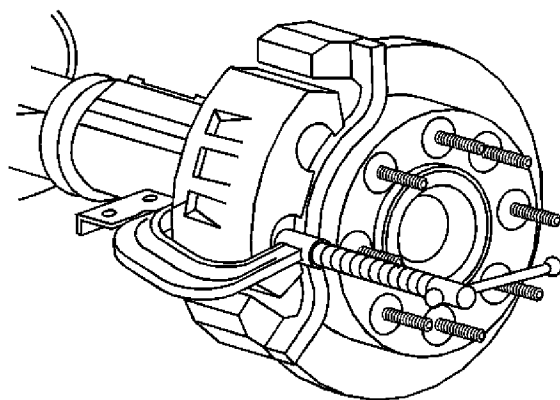
Rear Brake Caliper Replacement (With Single Rear Wheel)

Removal Procedure

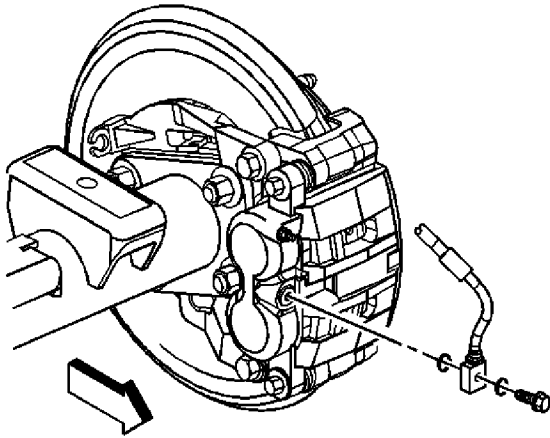
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Warning: Refer to [Brake Fluid Irritant Warning](#) in the Preface section.

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level then no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level then remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
5. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).



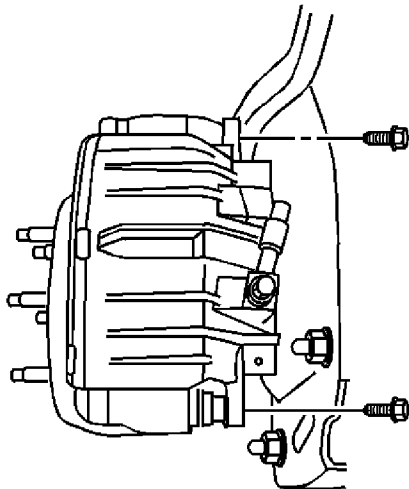
6. Compress the brake caliper pistons.
 - Install a large C-clamp over the top of the caliper housing and against the back of the outboard pad.
 - Slowly tighten the C-clamp until the pistons are pushed completely into the caliper bores.
 - Remove the C-clamp from the caliper.



7. Clean all dirt and foreign material from the brake hose end.

Note: Install a rubber cap or plug to the exposed brake pipe fitting end to prevent brake fluid loss and contamination.

8. Remove the brake hose to caliper bolt from the brake caliper.
9. Remove and discard the 2 copper brake hose gaskets. These gaskets may be stuck to the brake caliper housing or the brake hose end.

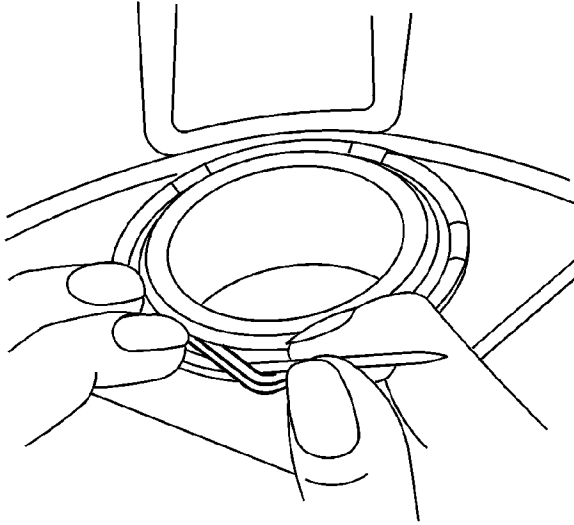


10. Remove the caliper guide pin bolts.
11. Remove the brake caliper from the vehicle.
12. Inspect the caliper assembly. Refer to [Brake Caliper Inspection](#).

Installation Procedure

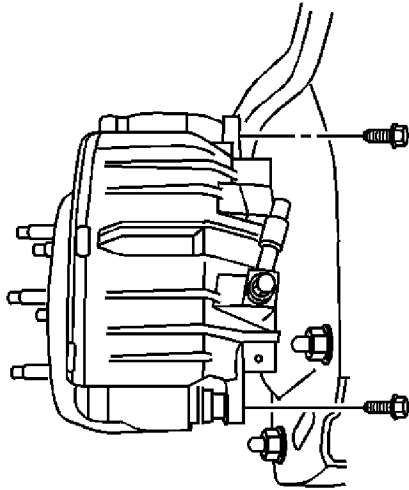
Note: Use denatured alcohol to clean the outside surface of caliper boots before installing new brake pads.

1. If you are installing new brake pads use a C-clamp in order to compress the pistons to the bottom of the caliper bores. Use the old brake pad, a metal plate or a wooden block across the face of the pistons in order to protect the pistons and the caliper boots.



Note: Use a small flat-bladed tool and lift the inner edge of the caliper boots next to both pistons to release any trapped air.

2. Ensure that the caliper boots are below the level of the face of both pistons.
3. Install the brake caliper to the brake caliper mounting bracket.
4. Perform the following procedure before installing the caliper guide pin bolts.
 - 4.1. Remove all traces of the original adhesive patch.
 - 4.2. Clean the threads of the bolt with brake parts cleaner or the equivalent and allow to dry.
 - 4.3. Apply threadlocker GM P/N 12345493 (Canadian P/N 10953488) to the threads of the bolt.



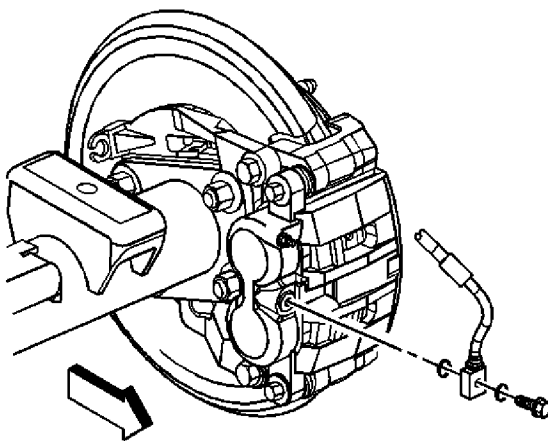
5. Install the brake caliper mounting bolts.

Caution: Refer to [Fastener Caution](#) in the Preface section.

6. Tighten the brake caliper guide pin bolts - rear.
 - Tighten the bolts to **34 N·m (25 lb ft) (JH5)**.
 - Tighten the bolts to **72 N·m (53 lb ft) (JH6, JH7)**.
7. Remove the rubber cap or plug from the exposed brake hose fitting end.

Note: Install 2 NEW copper brake hose gaskets.

8. Assemble the 2 NEW copper brake hose gaskets and the brake hose to caliper bolt to the brake hose.





9. Install the brake hose assembly to the brake caliper and tighten to **44 N·m (32 lb ft)**.
10. Bleed the hydraulic brake system. Refer to [Hydraulic Brake System Bleeding](#).
11. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
12. Lower the vehicle.
13. Fill the master cylinder reservoir to the proper level with clean brake fluid. Refer to [Master Cylinder Reservoir Filling](#).

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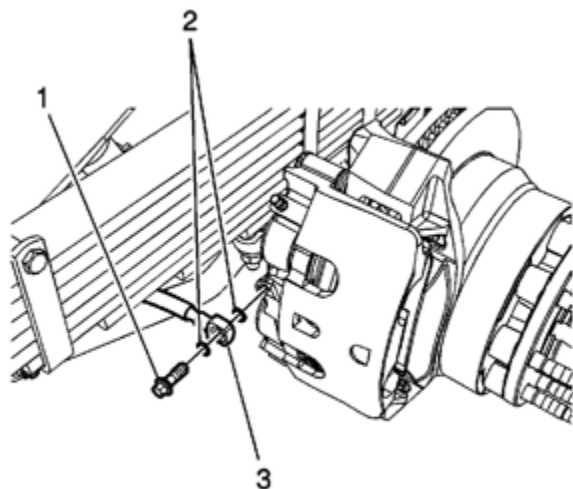
Rear Brake Caliper Replacement (Dual Rear Wheel)

Removal Procedure

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Warning: Refer to [Brake Fluid Irritant Warning](#) in the Preface section.

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level then no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level then remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
5. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
6. Position a large C-clamp against the outboard disc brake pad backing plate and over the rear of the brake caliper body.
7. Using the C-clamp, slowly and evenly bottom the brake caliper pistons into the brake caliper bores.

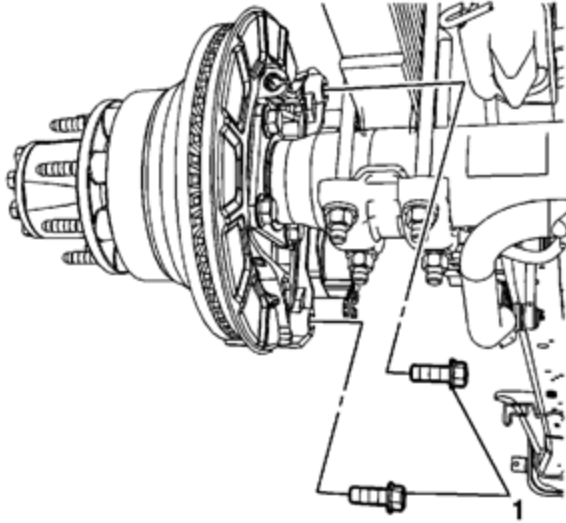


8. Remove the brake hose fitting bolt (1).

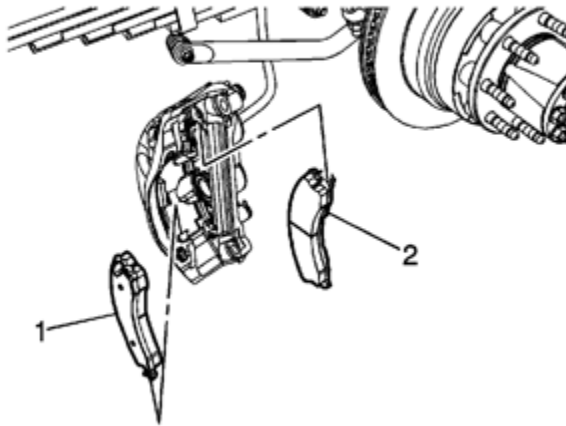
Note: Do not reuse the brake hose fitting gaskets.

9. Remove and discard the brake hose fitting gaskets (2) from the brake hose (3).

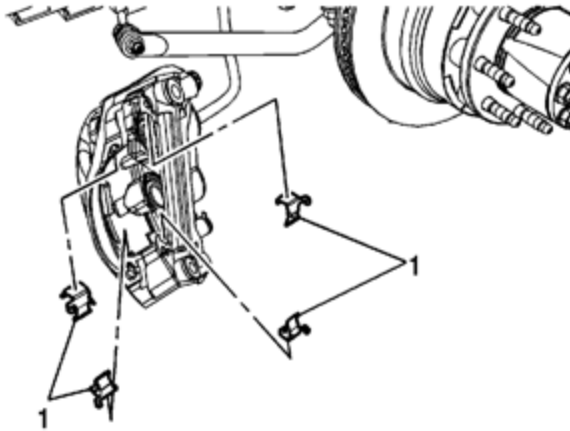
Cap the brake hose fitting to prevent brake fluid loss and contamination.



10. Remove the brake caliper bracket bolts (1).
11. Remove the brake caliper and bracket assembly.

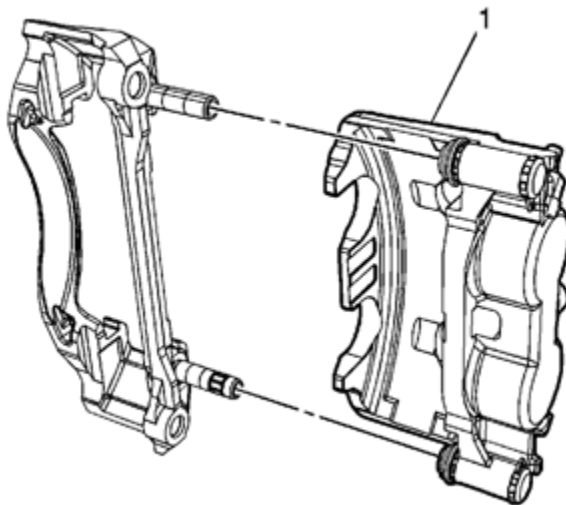


12. Remove the outer brake pad (1).
13. Remove the inner brake pad (2).

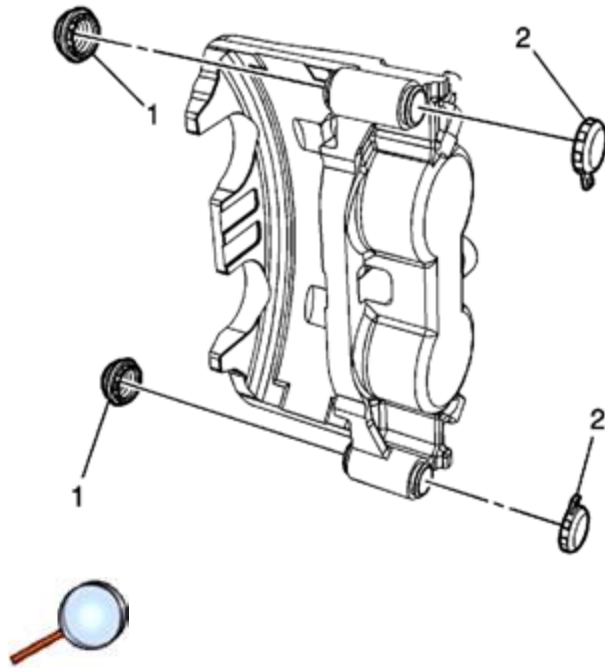


14. Remove the brake pad springs (1).

Note: Do not remove the brake caliper guide pins unless replacement is required.



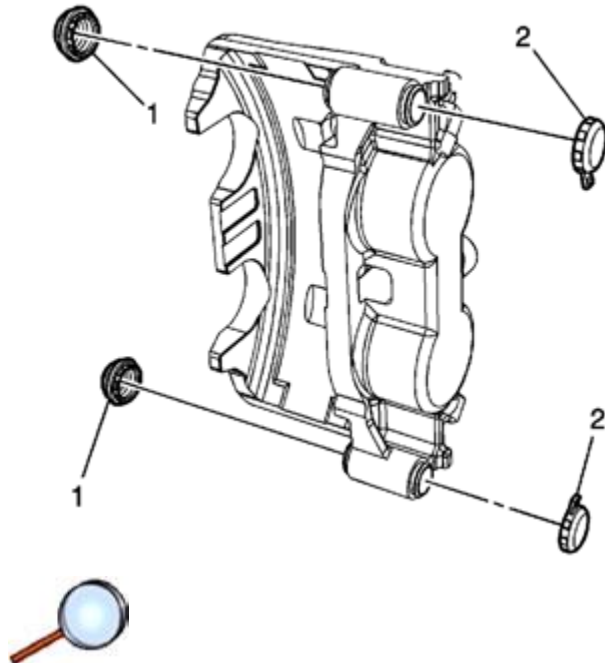
15. Slide the brake caliper (1) off of the brake caliper guide pins and the caliper bracket.
16. Inspect the brake caliper mounting and hardware for damage and wear. Refer to [Rear Disc Brake Mounting and Hardware Inspection](#).



17. Remove the brake caliper guide pin seals (1) and the brake caliper guide pin caps (2).

Installation Procedure

1. Apply a light coat of high temperature silicone brake lubricant to the brake caliper guide pin bores.



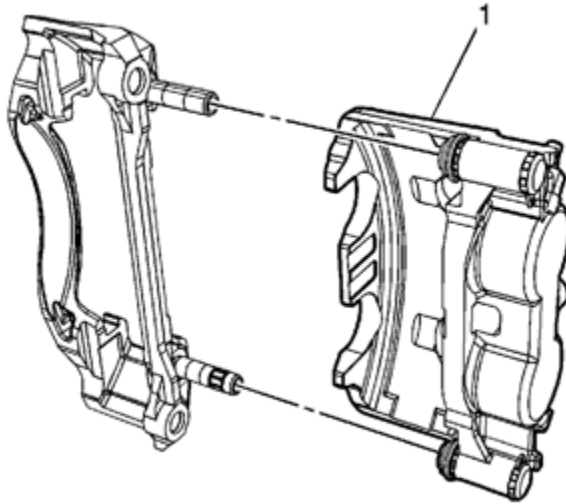
2. Install the brake caliper guide pin seals (1)

Ensure the brake caliper guide pin seals are fully seated in the groove of the brake caliper housing.

3. Install the brake caliper guide pin caps (2).

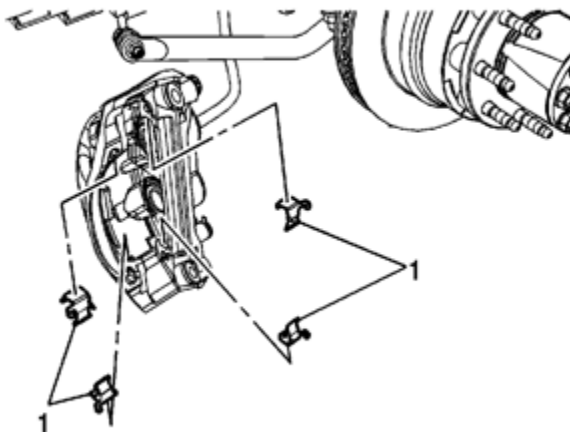
Ensure the brake caliper guide pin caps are fully seated in the groove of the brake caliper housing.

Note: Do not remove the brake caliper guide pins unless replacement is required.



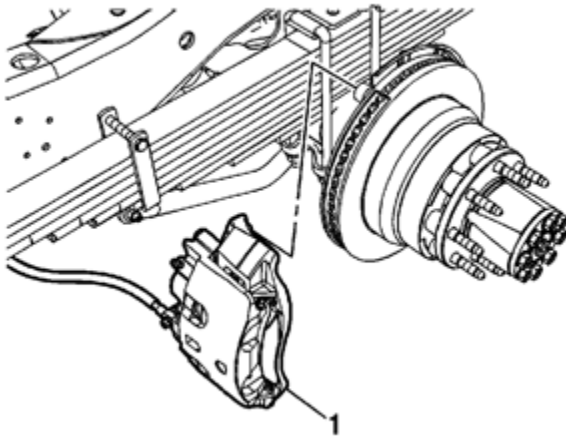
4. Slide the brake caliper (1) on to the brake caliper guide pins and the caliper bracket.

Ensure the brake caliper guide pin seals are fully seated in the groove of the brake caliper bracket.



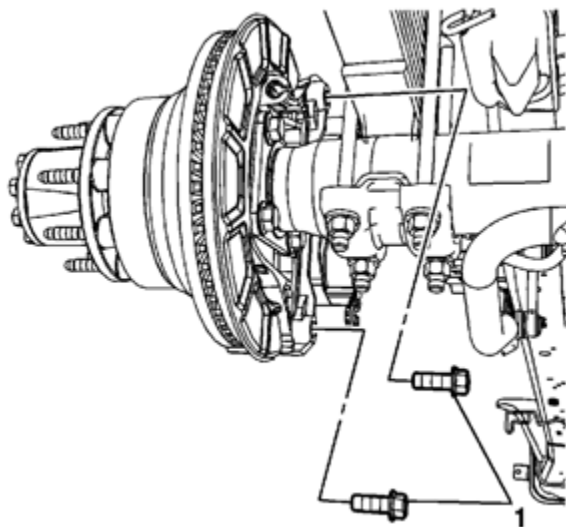
5. Install the brake pad springs (1).

6. Prepare the brake caliper bracket bolts and the rear axle threaded holes for assembly.
 - Clean the brake caliper bracket bolts of any threadlocking residue
 - Clean the rear axle threaded holes of any threadlocking residue with denatured alcohol and allow to dry
7. Apply threadlocker GM P/N 89021297 (Canadian P/N 10953488) to 2/3 of the threaded length of the brake caliper bracket bolt.
8. Allow the threadlocker to cure approximately 10 minutes before assembly.

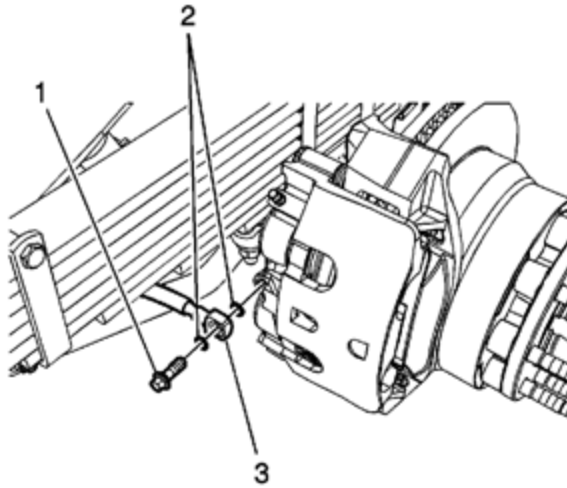


9. Position the brake caliper and bracket assembly (1) to the rear axle.

Caution: Refer to [Fastener Caution](#) in the Preface section.



10. Install the brake caliper bracket bolts (1) and tighten to **300N·m (221 lb ft)**.



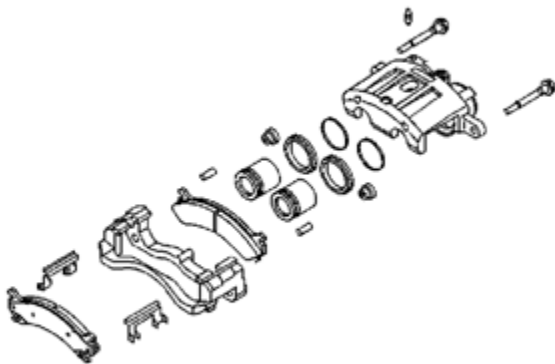
11. Assemble the brake hose fitting bolt (1) and 2 new brake hose fitting gaskets (2) to the brake hose (3).
12. Tighten the brake hose fitting bolt to **40 N·m (30 lb ft)**.
13. Bleed the hydraulic brake system. Refer to [Hydraulic Brake System Bleeding](#).
14. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).

Front Brake Caliper Overhaul

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

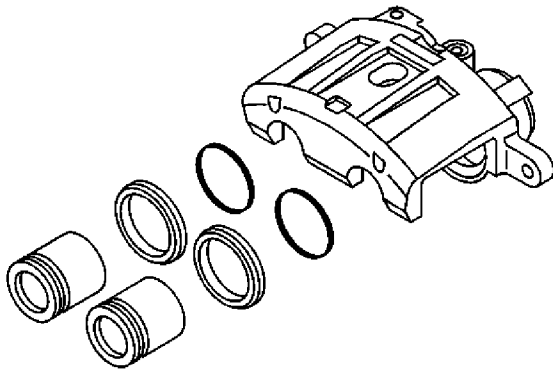
Warning: Refer to [Brake Fluid Irritant Warning](#) in the Preface section.

Disassembly Procedure

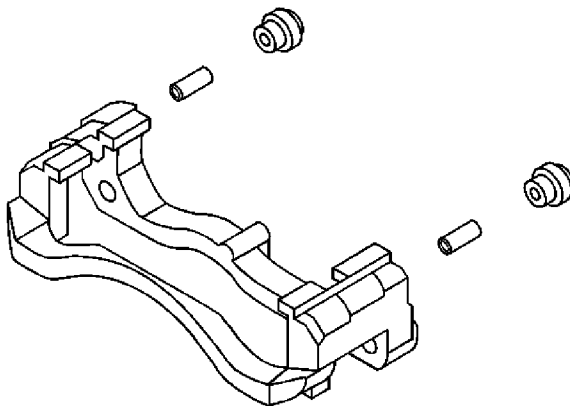


Warning: Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.

1. Remove the brake caliper from the vehicle. Refer to [Front Brake Caliper Replacement](#).
2. Place a thin piece of wood in front of the piston in order to prevent damage. Remove the piston by directing compressed air into the brake hose inlet fitting port of the brake caliper housing.



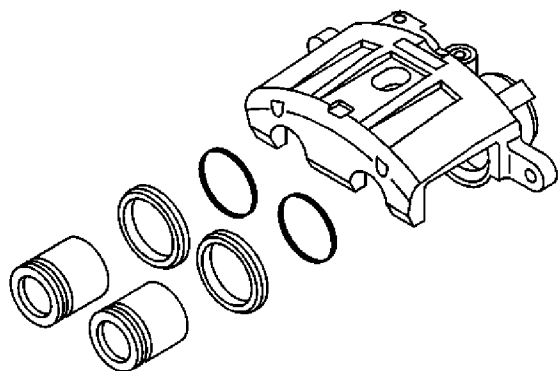
3. Remove the piston boot.
4. Remove the piston seal.
5. Remove the brake caliper bleed screw cap.
6. Remove the brake caliper bleed screw.
7. Inspect the brake caliper bore and the piston seal groove for scoring and corrosion. If you find excessive scoring or corrosion around the piston seal area, replace the brake caliper housing.



8. Inspect the brake caliper mounting bracket guide surfaces for corrosion and wear. Remove and replace the brake caliper mounting bracket if necessary.
9. Clean all of the residue from the brake pad guiding surfaces on the brake caliper housing and the brake caliper mounting bracket.
10. Clean all of the parts not included in the repair kit with denatured alcohol.
11. Dry all of the parts with filtered unlubricated compressed air.
12. Blow out all passages in the brake caliper housing and the brake caliper bleeder valve.

Assembly Procedure

Caution: Refer to [Fastener Caution](#) in the Preface section.



1. Install the brake caliper bleed screw and tighten to **12 N·m (106 lb in)**.
2. Install the brake caliper bleed screw cap.
3. Lubricate the new piston seals and the brake caliper bore seal grooves with brake fluid, GM P/N 12388967 (Canadian P/N 992667).
4. Install new seals into the brake caliper bore seal grooves.
5. Ensure that the seals are not twisted.
6. Lubricate the brake caliper bores and the pistons with brake fluid, GM P/N 12388967 (Canadian P/N 992667).
7. Install the boot and piston.
 - 7.1. Install the boot over the end of the piston so that the fold will face toward the brake caliper housing piston bore opening.
 - 7.2. Seat the boot into the brake caliper bore groove. Slide the piston into the brake caliper bore.
 - 7.3. Push down the piston to the bottom of the brake caliper bore.
 - 7.4. Ensure the boot seats properly into the piston groove and into the groove in the brake caliper bore.
 - 7.5. Repeat step 7 for the remaining piston.
8. Install the brake caliper to the vehicle. Refer to [Front Brake Caliper Replacement](#).

Rear Brake Caliper Overhaul (With Single Rear Wheel (JH5))

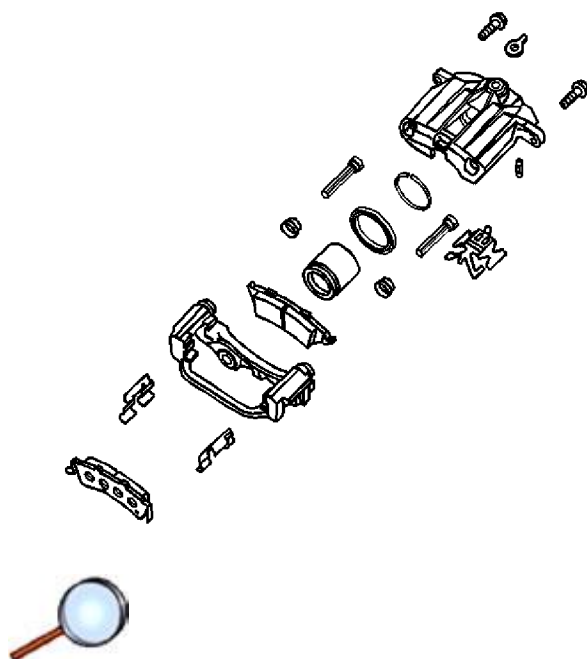
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Warning: Refer to [Brake Fluid Irritant Warning](#) in the Preface section.

Disassembly Procedure

Note:

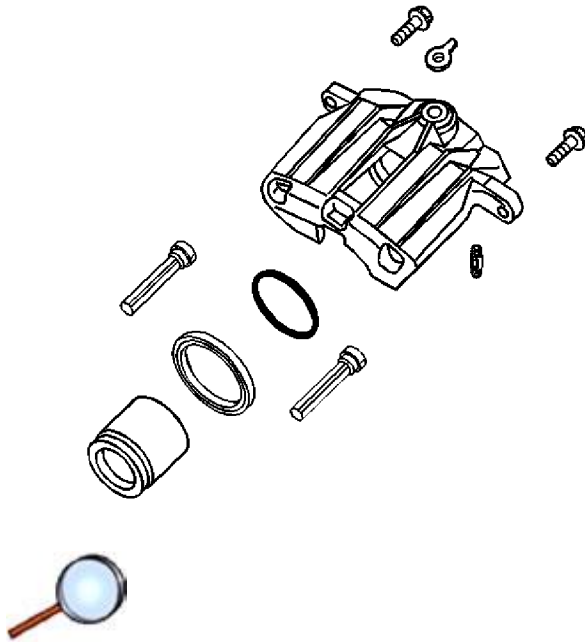
- Replace all the components included in the repair kits used to service this brake caliper.
- Lubricate the rubber parts with clean brake fluid to make assembly easier.
- The torque values specified are for dry, non lubricated fasteners.
- Perform the service operations on a clean bench free from all mineral oil materials.



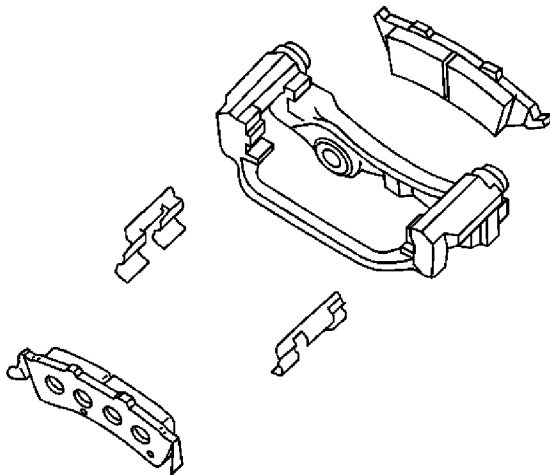
1. Remove the brake caliper from the vehicle. Refer to [Rear Brake Caliper Replacement](#).

Warning: Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.

2. Place a thin piece wood in front of the piston in order to prevent damage. Remove the piston by directing compressed air into the brake hose inlet fitting port of the brake caliper housing.



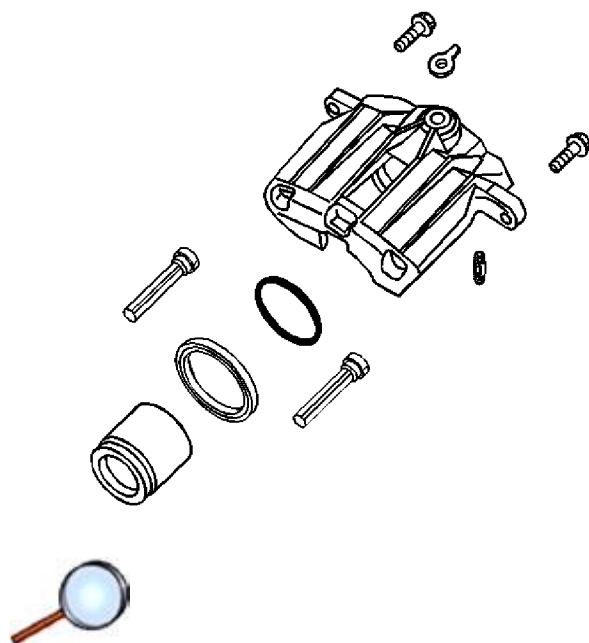
3. Remove the piston boot.
4. Remove the piston seal.
5. Remove the brake caliper bleed screw cap.
6. Remove the brake caliper bleed screw.
7. Inspect the brake caliper bore and the piston seal groove for scoring and corrosion. If you find excessive scoring or corrosion around the piston seal area, replace the brake caliper housing.



8. Inspect the brake caliper mounting bracket guide surfaces for corrosion and wear. Remove and replace the brake caliper mounting bracket if needed.
9. Clean all of the residue from the brake pad guiding surfaces on the brake caliper housing and the brake caliper mounting bracket.
10. Clean all of the parts not included in the repair kit with denatured alcohol.
11. Dry all the parts with non lubricated filtered compressed air.
12. Blow out all passages in the brake caliper housing and the brake caliper bleeder valve.

Assembly Procedure

Caution: Refer to [Fastener Caution](#) in the Preface section.



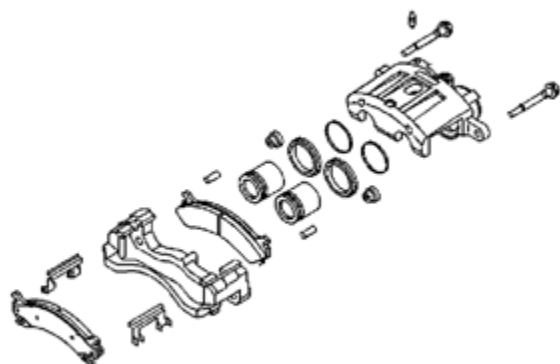
1. Install the brake caliper bleed screw and tighten to **12 N·m (106 lb in)**.
2. Install the brake caliper bleed screw cap.
3. Lubricate the new piston seal and the brake caliper bore seal groove with brake fluid.
4. Install the new seal into the brake caliper bore seal groove.
5. Ensure that the seal is not twisted.
6. Lubricate the brake caliper bore and the piston with brake fluid.
7. Install the boot and piston.
 - 7.1. Install the boot over the end of the piston so that the fold will face toward the brake caliper housing piston bore opening.
 - 7.2. Seat the boot into the brake caliper bore groove. Slide the piston into the brake caliper bore.
 - 7.3. Push down the piston to the bottom of the brake caliper bore.
 - 7.4. Ensure that the boot is properly seats into the piston groove and into the groove in the brake caliper bore.
8. Install the brake caliper to the vehicle. Refer to [Rear Brake Caliper Replacement](#).

Rear Brake Caliper Overhaul (With Single Rear Wheel (JH6, JH7))

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Warning: Refer to [Brake Fluid Irritant Warning](#) in the Preface section.

Disassembly Procedure



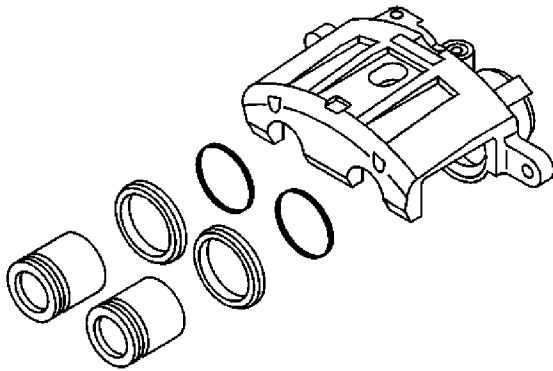
Note:

- Replace all the components included in the repair kits used to service this brake caliper.
- Lubricate the rubber parts with clean brake fluid to make assembly easier.
- The torque values specified are for dry, non lubricated fasteners.
- Perform the service operations on a clean bench, free from all mineral oil materials.

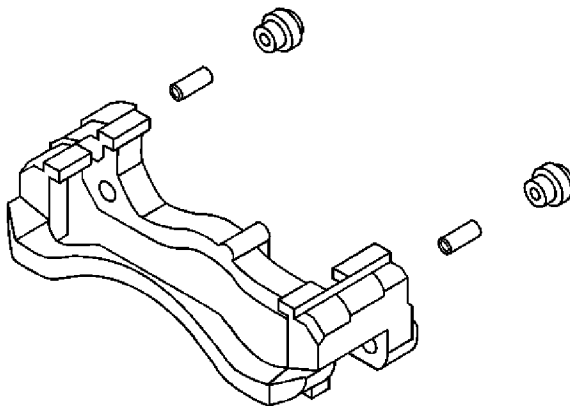
1. Remove the brake caliper from the vehicle. Refer to [Rear Brake Caliper Replacement](#).

Warning: Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.

2. Place a thin piece wood in front of the pistons in order to prevent damage. Remove the pistons by directing compressed air into the brake hose inlet fitting port of the brake caliper housing.
3. Remove the 2 pistons.



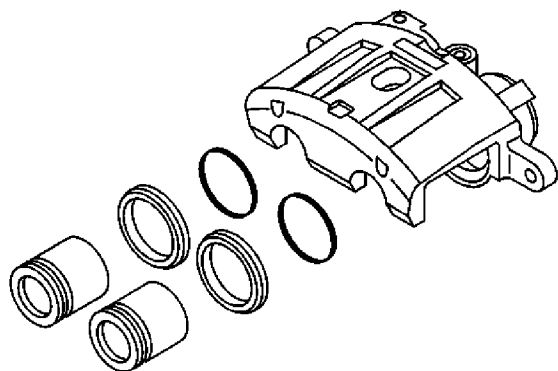
4. Remove the 2 piston boots.
5. Remove the 2 piston seals.
6. Remove the brake caliper bleed screw cap.
7. Remove the brake caliper bleed screw.
8. Inspect the brake caliper bores and the piston seal grooves for scoring and corrosion. If you find excessive scoring or corrosion around the 2 piston seal areas replace the brake caliper housing.



9. Inspect the brake caliper mounting bracket guide surfaces for corrosion and wear. Remove and replace the brake caliper mounting bracket if needed.
10. Clean all the residue from the brake pad guiding surfaces on the brake caliper housing and the brake caliper mounting bracket.
11. Clean all the parts not included in the repair kit with denatured alcohol.
12. Dry all the parts with non lubricated filtered compressed air.
13. Blow out all passages in the brake caliper housing and the brake caliper bleeder valve.

Assembly Procedure

Caution: Refer to [Fastener Caution](#) in the Preface section.



1. Install the brake caliper bleed screw and tighten to **12 N·m (106 lb in)**.
2. Install the brake caliper bleed screw cap.
3. Lubricate the new piston seal and the brake caliper bore seal groove with brake fluid.
4. Install new the seal into the brake caliper bore seal groove.
5. Ensure that the seal is not twisted.
6. Lubricate the brake caliper bore and the piston with brake fluid.
7. Install the boot and the piston.
 - 7.1. Install the boot over the end of the piston so that the fold will face toward the brake caliper housing piston bore opening.
 - 7.2. Seat the boot into the brake caliper bore groove. Slide the piston into the brake caliper bore.
 - 7.3. Push down the piston to the bottom of the brake caliper bore.
 - 7.4. Ensure that the boot properly seats into the piston groove and into the groove in the brake caliper bore.
 - 7.5. Repeat steps 5 and 6 for the remaining piston.
8. Install the brake caliper to the vehicle. Refer to [Rear Brake Caliper Replacement](#).

Rear Brake Caliper Overhaul (With Dual Rear Wheel)

Special Tools

- J-8092 Driver Handle
- J-45515 Piston Seal Installer

Disassembly Procedure

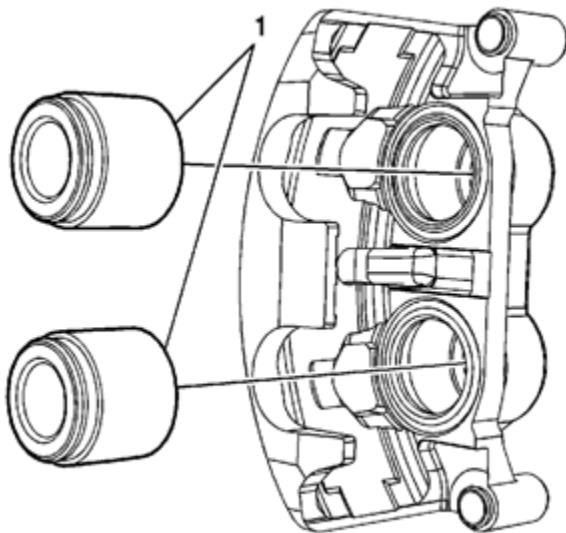
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Warning: Refer to [Brake Fluid Irritant Warning](#) in the Preface section.

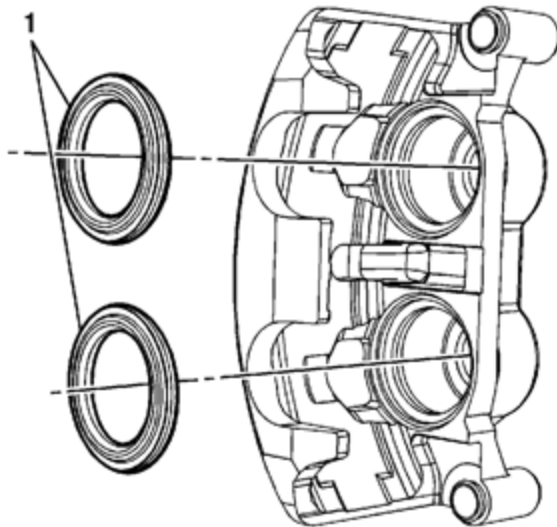
Note: Replace all the components included in the repair kits used to overhaul the brake caliper.

1. Remove the brake caliper. Refer to [Rear Brake Caliper Replacement](#).
2. Place a wood block between the brake caliper pistons and the brake caliper housing bridge.

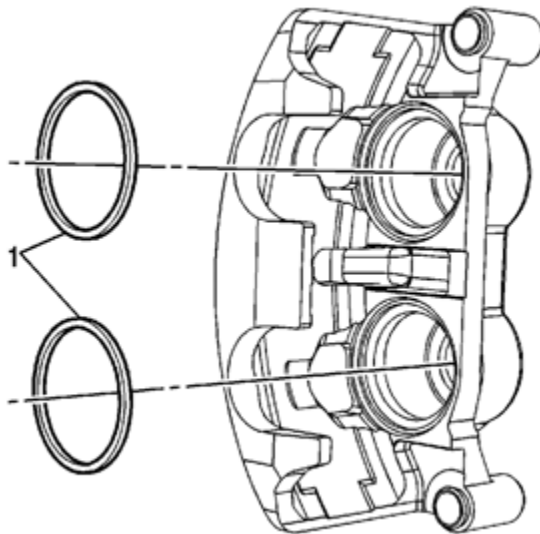
Warning: Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.



3. Place a clean shop towel between the brake caliper pistons and the block of wood.
4. Apply compressed air through the brake hose fitting inlet port and remove the brake caliper pistons (1).
5. Remove the brake caliper bleeder screw.



6. Using a blunt wooden or plastic tool, remove the brake caliper piston dust seals (1).



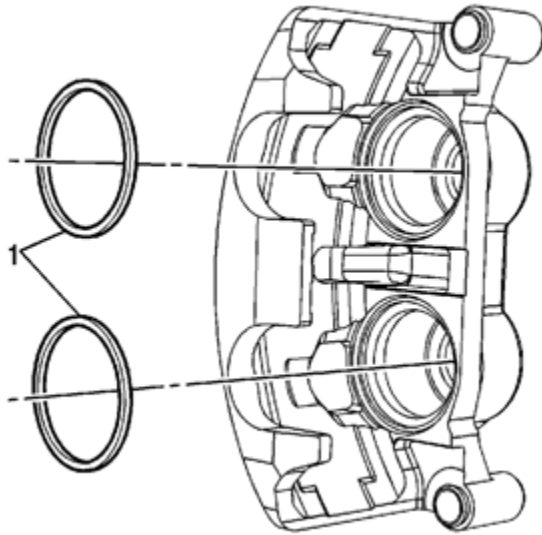
7. Using a blunt wooden or plastic tool, remove the brake caliper piston seals (1).
8. Inspect the brake caliper bores for corrosion, grooves, and scoring.
- Inspect the caliper piston bores
 - Inspect the caliper piston seal grooves
- If excessive corrosion, grooving, or scoring is found, replace the brake caliper.
9. Clean the brake caliper housing and any parts to be reused with denatured alcohol.
10. Dry all components with dry, filtered, non-lubricated compressed air.

Assembly Procedure

1. Apply a light coating of GM approved brake fluid from a clean, sealed brake fluid container to

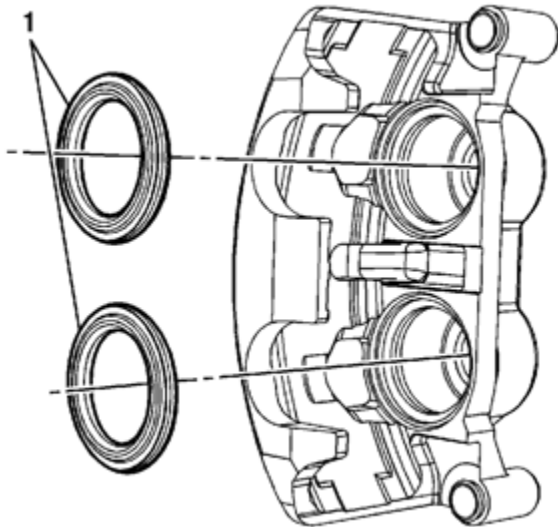
the brake caliper components:

- Brake caliper piston bores
- Brake caliper pistons
- Brake caliper piston seals



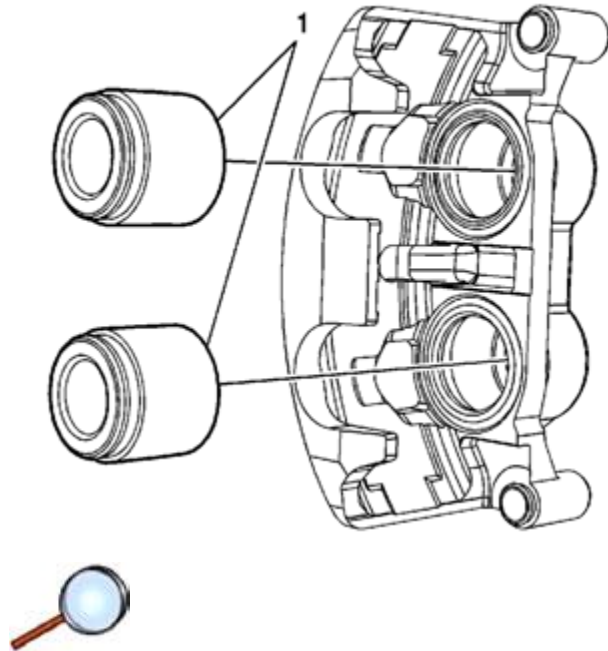
2. Install the brake caliper piston seals (1) to the brake caliper piston bores.

Ensure the brake caliper piston seals are fully seated in the groove of the caliper piston bores and are not distorted.



3. Using the J-45515 Piston Seal Installer with the J-8092 Driver Handle , install the brake

caliper piston dust seals (1).



4. Install the brake caliper pistons (1) into the brake caliper housing.

Use firm, downward hand pressure to press the brake caliper pistons squarely into the caliper bores.

5. Seat the edge of the brake caliper dust seals in the groove in the brake caliper piston.
6. If necessary, carefully lift the edge of the brake caliper dust seals at the brake caliper piston to release any trapped air.
7. Install the brake caliper. Refer to [Rear Brake Caliper Replacement](#).

Front Disc Brake Hardware Replacement

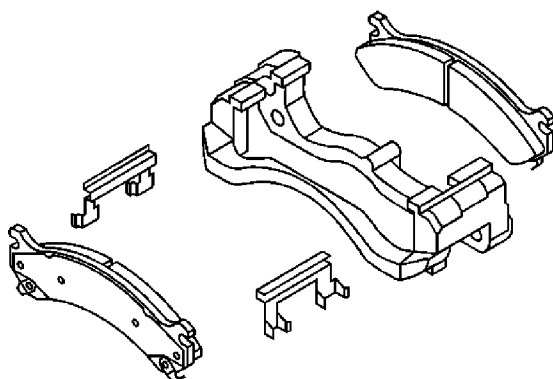
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Removal Procedure

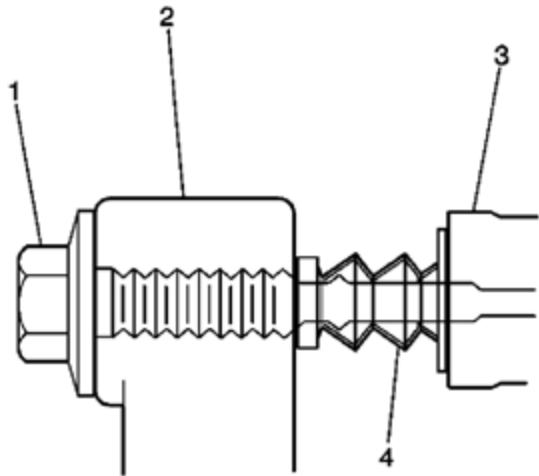
1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).

Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

3. Remove the caliper from the mounting bracket and support the caliper with heavy mechanic's wire or equivalent. DO NOT disconnect the hydraulic brake flexible hose from the caliper. Refer to [Front Brake Caliper Replacement](#).



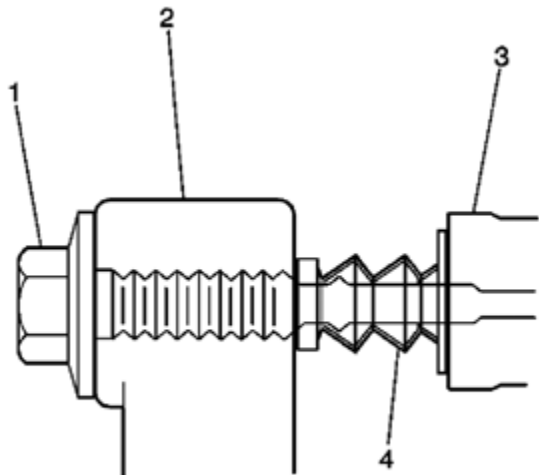
4. Remove the disc brake pads from the disc brake caliper mounting bracket.
5. Remove the disc brake pad retainers from the disc brake caliper mounting bracket.
6. Inspect the disc brake hardware. Refer to [Front Disc Brake Mounting and Hardware Inspection](#).



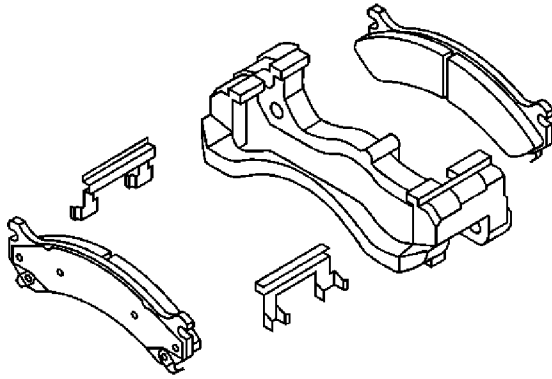
7. Remove the caliper pin boots (4) from the disc brake caliper mounting bracket (3).

Installation Procedure

1. Lubricate the front brake caliper bushings, bolts and seals with high temperature silicone brake lubricant.



2. Install the caliper pin boots (4) to the disc brake caliper mounting bracket (3).



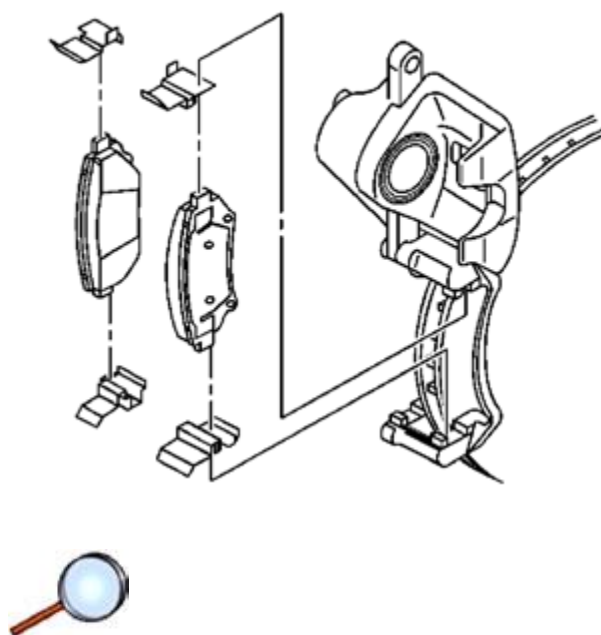
3. Install the disc brake pad retainers to the disc brake caliper mounting bracket.
4. Install the disc brake pads to the disc brake caliper mounting bracket.
5. Install the disc brake caliper to the caliper mounting bracket. Refer to [Front Brake Caliper Replacement](#).
6. With the engine OFF, gradually apply the brake pedal approximately 2/3 of its travel distance.
7. Slowly release the brake pedal.
8. Wait 15 seconds, then repeat steps 6-7 until a firm brake pedal is obtained. This will properly seat the brake caliper pistons and brake pads.

Rear Disc Brake Hardware Replacement (With Single Rear Wheel)

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

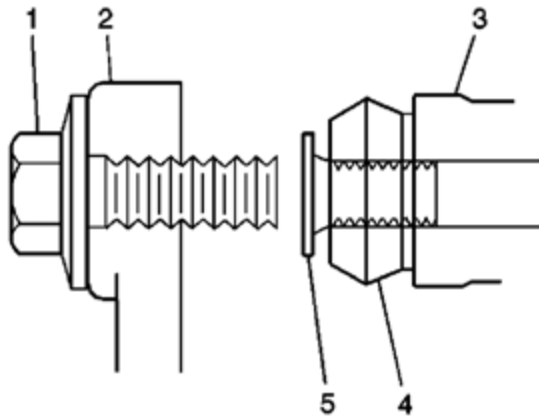
Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).



Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

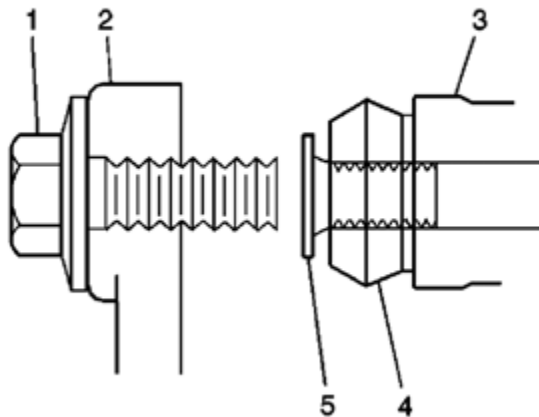
3. Remove the brake caliper from the brake caliper mounting bracket and support the brake caliper with heavy mechanic wire or equivalent. DO NOT disconnect the hydraulic brake hose from the caliper. Refer to [Rear Brake Caliper Replacement](#).
4. Remove the disc brake pads from the brake caliper mounting bracket.
5. Remove the disc brake pad retainers from the brake caliper mounting bracket.



6. Remove the caliper slide pins (5) from the brake caliper mounting bracket (3).
7. Remove the caliper slide pin boots (4) from the brake caliper mounting bracket.
8. Inspect the disc brake hardware. Refer to [Rear Disc Brake Mounting and Hardware Inspection](#).

Installation Procedure

1. Lubricate the brake caliper mounting bracket bushings and the caliper slide pins with high temperature silicone brake lubricant.



2. Install the caliper slide pin boots (4) to the disc brake caliper mounting bracket.
3. Install the caliper slide pins (5) to the brake caliper mounting bracket (3).
4. Install the disc brake pad retainers to the brake caliper mounting bracket.
5. Install the disc brake pads to the brake caliper mounting bracket.

6. Install the disc brake caliper to the brake caliper mounting bracket. Refer to [Rear Brake Caliper Replacement](#).
7. With the engine OFF, gradually apply the brake pedal approximately 2/3 of its travel distance.
8. Slowly release the brake pedal.
9. Wait 15 seconds, then repeat steps 7-8 until a firm brake pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
10. Lower the vehicle.

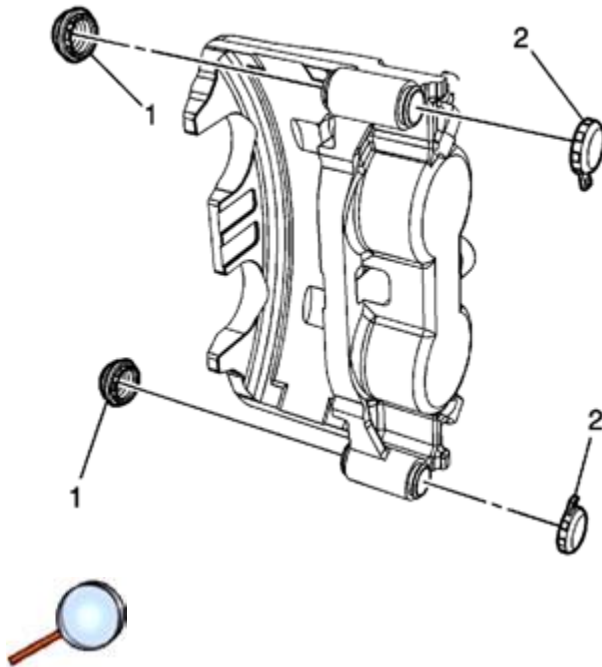
cardiagn.com

Rear Disc Brake Hardware Replacement (With Dual Rear Wheel)

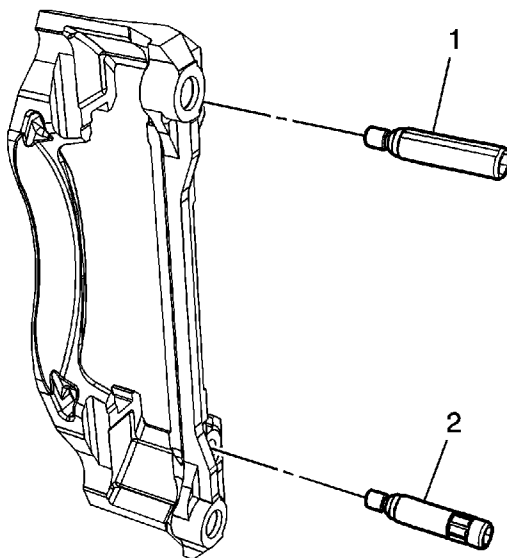
Removal Procedure

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

1. Remove the brake caliper bracket. Refer to [Rear Brake Caliper Bracket Replacement](#).



2. Remove the brake caliper guide pin seals (1).
3. Remove the brake caliper guide pin caps (2).





4. Remove the brake caliper upper guide pin (1).

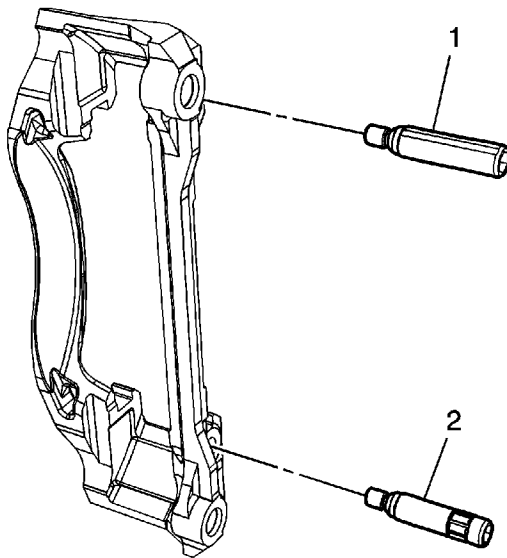
Note: The lower brake caliper guide pin is equipped with a bushing.

5. Remove the lower brake caliper guide pin (2).
6. Inspect the rear disc brake hardware. Refer to [Rear Disc Brake Mounting and Hardware Inspection](#).

Installation Procedure

1. Apply a light coat of high temperature silicone brake lubricant to the brake caliper guide pin surfaces:
 - Apply lubricant to the brake caliper guide pin shafts.
 - Apply lubricant to the brake caliper guide pin seats.
 - Apply lubricant to the brake caliper guide pin threads.

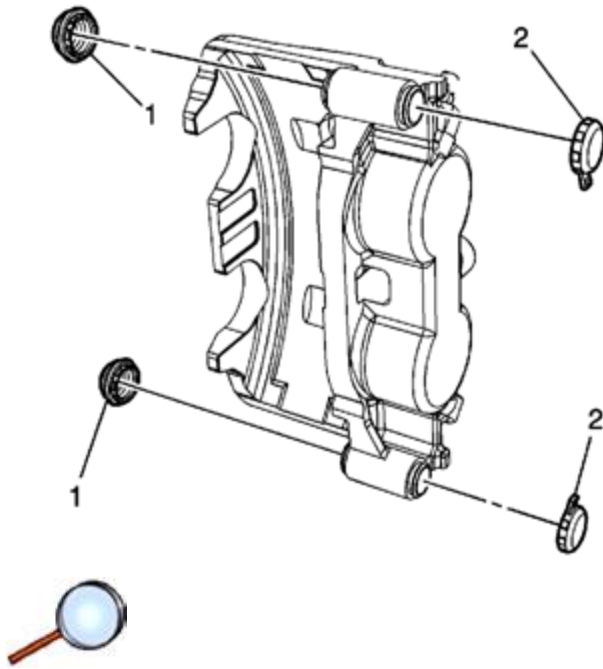
Caution: Refer to [Fastener Caution](#) in the Preface section.



2. Install the upper brake caliper guide pin (1) and tighten to **61 N·m (45 lb ft)**.

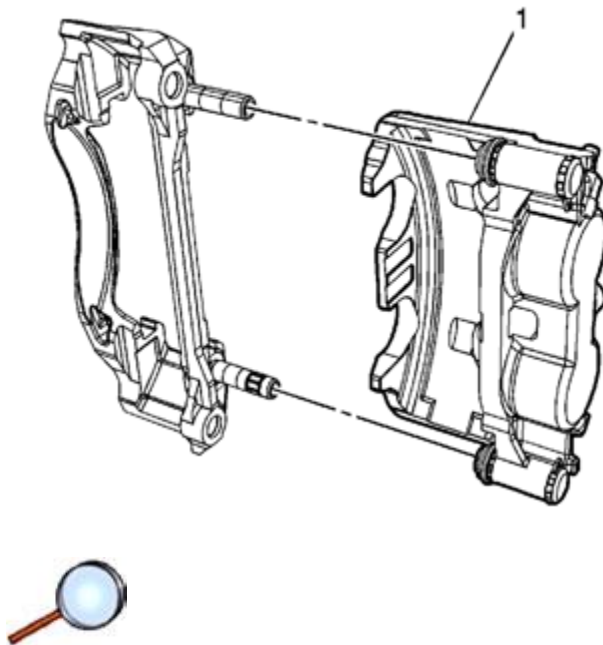
Note: The lower brake caliper guide pin is equipped with a bushing.

3. Install the lower brake caliper guide pin (2) and tighten to **61 N·m (45 lb ft)**.
4. Apply a light coat of high temperature silicone brake lubricant to the brake caliper guide bores and seals.



5. Install the brake caliper guide pin seals (1) and caps (2), if removed.

Ensure the brake caliper guide pin seals and caps are fully seated in the grooves of the brake caliper housing.



6. Install the rear disc brake caliper (1) to the brake caliper bracket.

Ensure the brake caliper guide pin seals are fully seated in the grooves of the brake caliper bracket.

7. Install the brake caliper bracket. Refer to [Rear Brake Caliper Bracket Replacement](#).

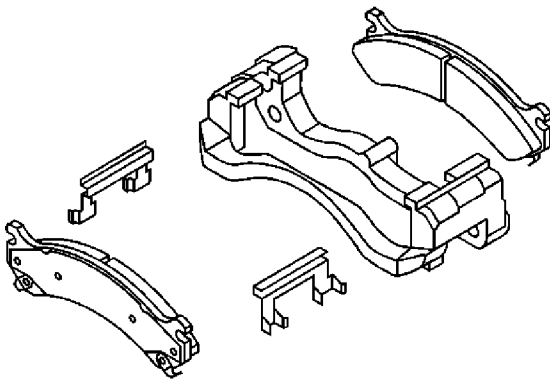
Front Brake Caliper Bracket Replacement

Removal Procedure

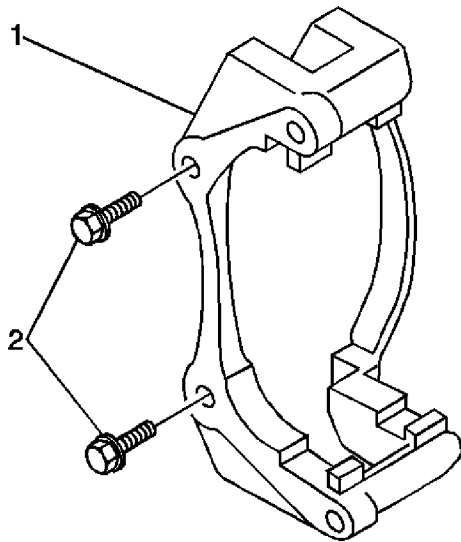
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

1. Remove the caliper from the mounting bracket and support the caliper with heavy mechanic's wire or equivalent. DO NOT disconnect the hydraulic brake flexible hose from the caliper. Refer to [Front Brake Caliper Replacement](#).

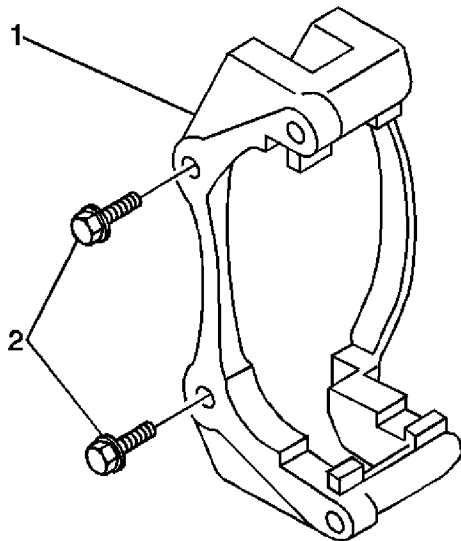


2. Remove the brake pads.
3. Remove the anti-rattle clips from the brake caliper bracket.



4. Remove the brake caliper bracket mounting bolts (2).
5. Remove the brake caliper bracket (1).
6. Remove any contaminants or foreign material from the inside ends of the brake caliper bracket.
7. Clean the mounting surface and threads of the brake caliper bracket.

Installation Procedure

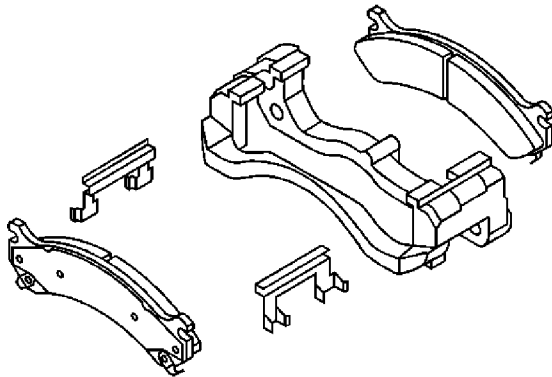


1. Install the brake caliper bracket (1).
2. Perform the following procedure before installing the brake caliper bracket mounting bolts.
 - Remove all traces of the original adhesive patch.

- Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
- Apply threadlocker GM P/N 12345493 (Canadian P/N 10953488).

Caution: Refer to [Fastener Caution](#) in the Preface section.

3. Install the caliper bracket mounting bolts (2).
 - JH5: Tighten the bolts to **175 N·m (129 lb ft)**.
 - JH6, JH7: Tighten the bolts to **300 N·m (221 lb ft)**.



4. Install the anti-rattle clips to the brake caliper bracket.
5. Install the brake pads to the brake caliper bracket.
6. Slide the brake pads in until they contact the rotor.
7. Install the brake caliper. Refer to [Front Brake Caliper Replacement](#).
8. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
9. Lower the vehicle.
10. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
11. Slowly release the brake pedal.
12. Wait 15 seconds, then repeat steps 10-11 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.

Rear Brake Caliper Bracket Replacement (With Single Rear Wheel)

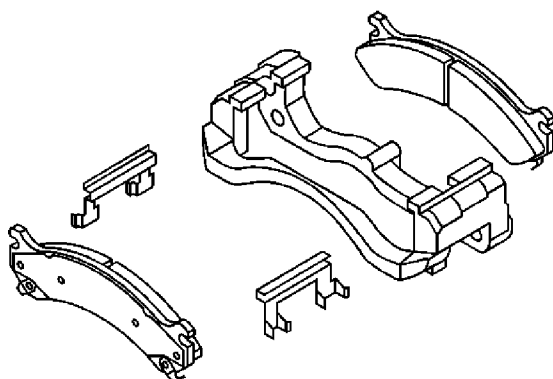
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Removal Procedure

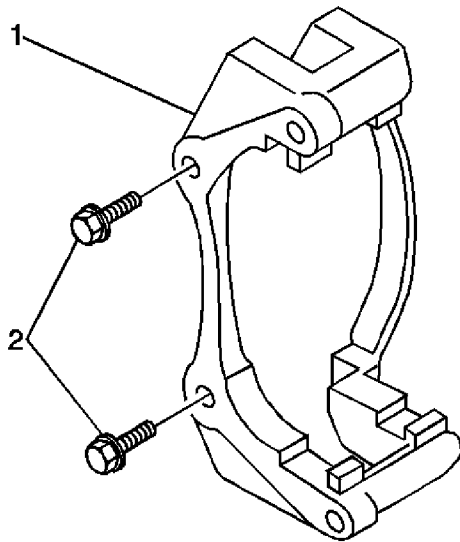
1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).

Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

3. Remove the brake caliper from the brake caliper mounting bracket and support the brake caliper with heavy mechanic's wire or equivalent. DO NOT disconnect the hydraulic brake hose from the brake caliper. Refer to [Rear Brake Caliper Replacement](#).

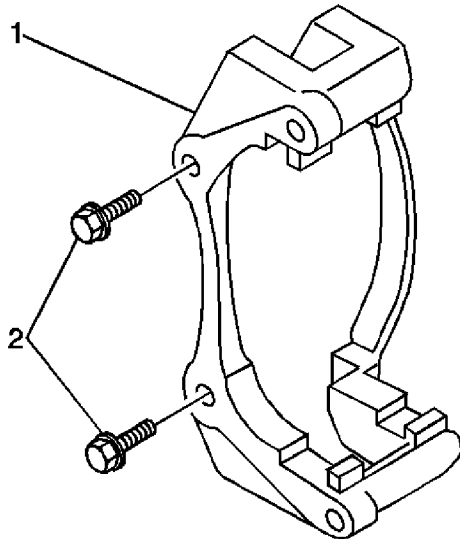


4. Remove the brake pads from the brake caliper mounting bracket.
5. Remove the anti-rattle clips from the brake caliper bracket.



6. Remove the brake caliper bracket mounting bolts (2).
7. Remove the brake caliper bracket (1).
8. Remove any contaminants or foreign material from the inside ends of the brake caliper bracket.
9. Clean the mounting surface and threads of the brake caliper bracket.

Installation Procedure

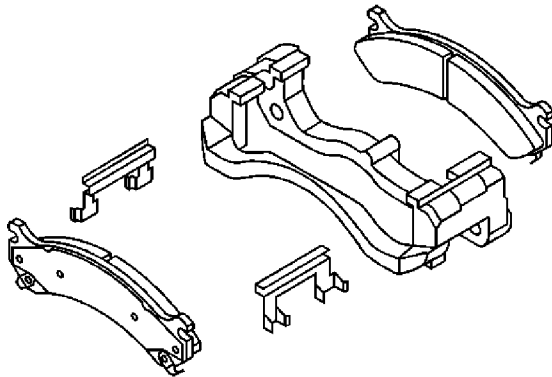


1. Install the brake caliper bracket (1).
2. Perform the following procedure before installing the brake caliper bracket mounting bolts.
 - 2.1. Remove all traces of the original adhesive patch.

- 2.2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
- 2.3. Apply threadlocker GM P/N 12345493 (Canadian P/N 10953488) to the threads of the bolt.

Caution: Refer to [Fastener Caution](#) in the Preface section.

3. Install the caliper bracket mounting bolts (2).
 - JH5: Tighten the bolts to **200 N·m (148 lb ft)**.
 - JH6, JH7: Tighten the bolts to **165 N·m (123 lb ft)**.



4. Install the anti-rattle clips to the brake caliper mounting bracket.
5. Install the brake pads to the brake caliper mounting bracket.
6. Slide the brake pads in until they contact the rotor.
7. Install the brake caliper. Refer to [Rear Brake Caliper Replacement](#).
8. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
9. Lower the vehicle.
10. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
11. Slowly release the brake pedal.
12. Wait 15 seconds, then repeat steps 10-11 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.

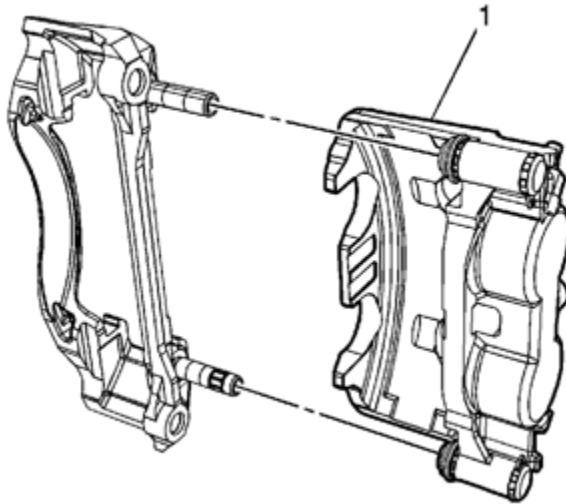
Rear Brake Caliper Bracket Replacement (With Dual Rear Wheel)

Removal Procedure

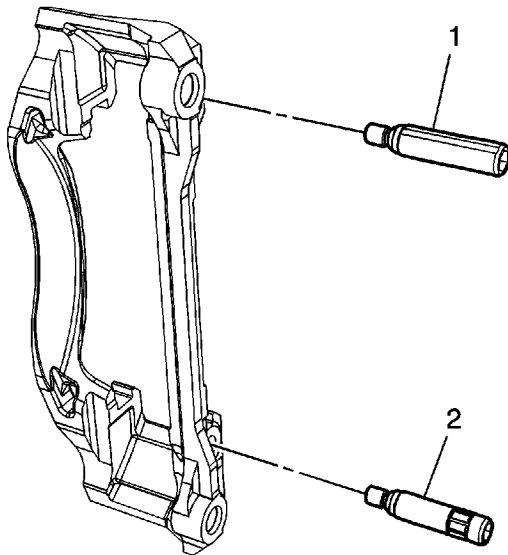
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

1. Remove the rear disc brake pads. Refer to [Rear Disc Brake Pads Replacement](#).

Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.



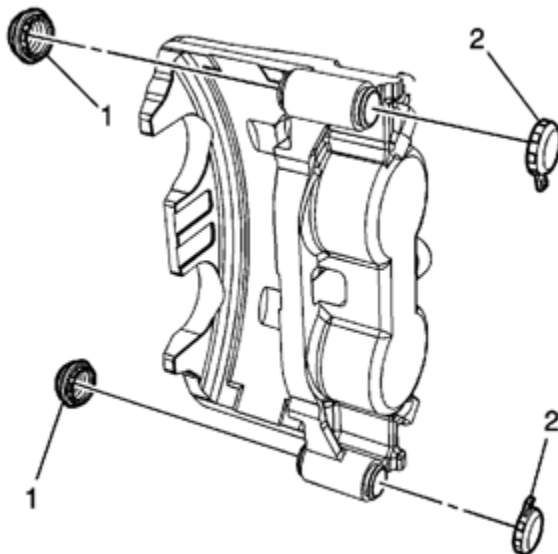
2. Remove the rear disc brake caliper (1) from the brake caliper bracket and support with heavy mechanics wire or equivalent.



3. If necessary, remove the upper brake caliper guide pin (1).

Note: The lower brake caliper guide pin is equipped with a bushing.

4. If necessary, remove the lower brake caliper guide pin (2).



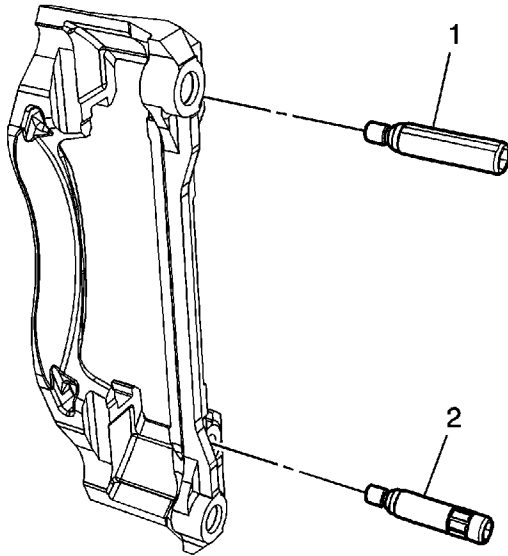
5. Inspect the brake caliper guide pin seals (1) and caps (2) for damage and wear. Refer to [Rear Disc Brake Mounting and Hardware Inspection](#).

Installation Procedure

1. Apply a light coat of high temperature silicone brake lubricant to the brake caliper guide pin surfaces:

- Apply lubricant to the brake caliper guide pin shafts.
- Apply lubricant to the brake caliper guide pin seats.
- Apply lubricant to the brake caliper guide pin threads.

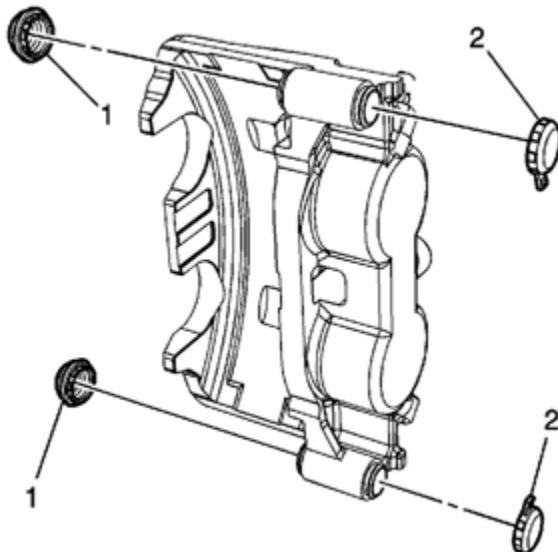
Caution: Refer to [Fastener Caution](#) in the Preface section.



2. If removed, install the upper brake caliper guide pin (1) and tighten to **61 N·m (45 lb ft)**.

Note: The lower brake caliper guide pin is equipped with a bushing.

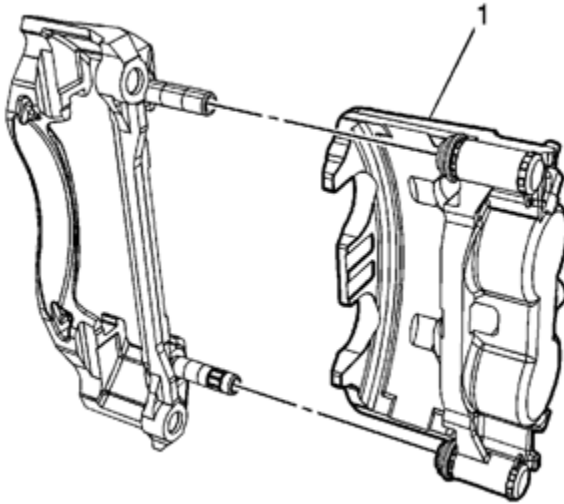
3. If removed, install the lower brake caliper guide pin (2) and tighten to **61 N·m (45 lb ft)**.
4. Apply a light coat of high temperature silicone brake lubricant to the brake caliper guide bores and seals.





5. Install the brake caliper guide pin seals (1) and caps (2), if removed.

Ensure the brake caliper guide pin seals and caps are fully seated in the grooves of the brake caliper housing.



6. Install the rear disc brake caliper (1) to the brake caliper bracket.

Ensure the brake caliper guide pin seals are fully seated in the grooves of the brake caliper bracket.

7. Install the rear disc brake pads. Refer to [Rear Disc Brake Pads Replacement](#).

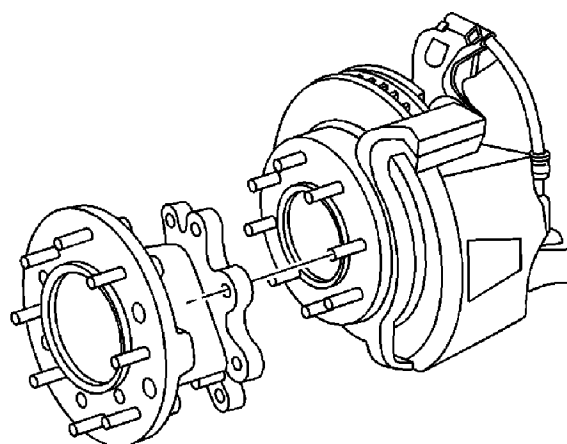
Front Brake Rotor Replacement

Special Tools

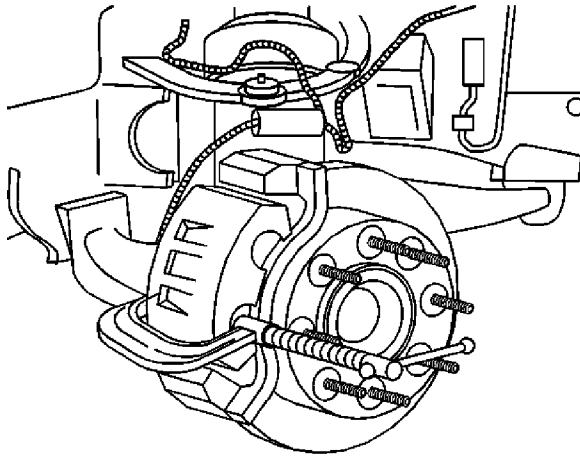
- [J 41013](#) Rotor Resurfacing Kit
- [J 42450-A](#) Wheel Hub Resurfacing Kit

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

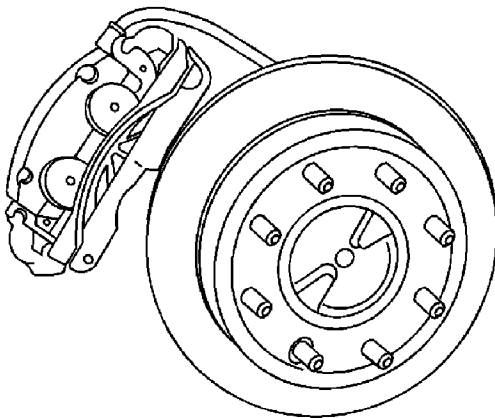
Removal Procedure



1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
3. Remove the front wheel hub extension, dual wheel vehicles only.
 - 3.1. Insert a drift or large screwdriver through the brake caliper into one of the brake rotor vanes in order to prevent the rotor from turning.
 - 3.2. Mark the relationship of the front wheel hub extension to the hub.
 - 3.3. Remove the front wheel hub extension bolts.
 - 3.4. Remove the front wheel hub extension from the vehicle. It may be necessary to tap around the perimeter of the hub extension with a rubber mallet to loosen it from the hub.



4. Mark the relationship of the rotor to the hub.
5. Install a C-clamp over the body of the brake caliper, with the C-clamp ends against the rear of the caliper body and the outboard disc brake pad.
6. Slowly tighten the C-clamp until the pistons are pushed into the caliper bores enough to remove the caliper from the pads.
7. Remove the C-clamp from the caliper.

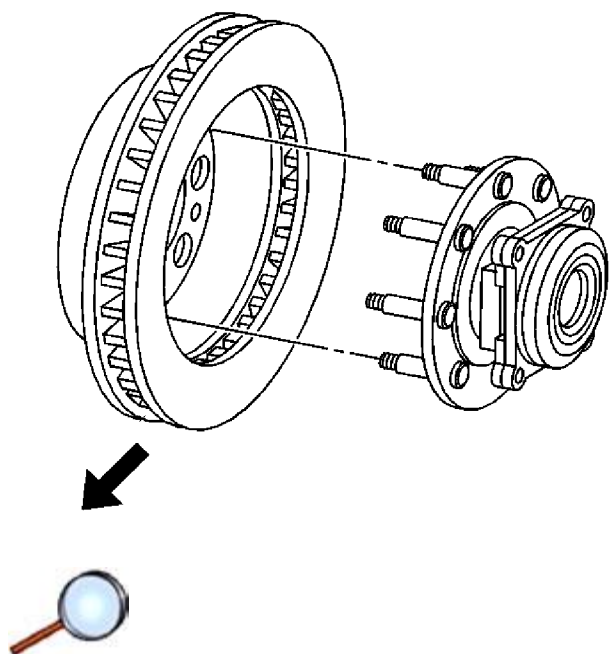


Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

8. Remove the brake caliper and brake caliper bracket as an assembly and support with heavy

mechanics wire or equivalent. DO NOT disconnect the hydraulic brake flexible hose from the caliper.

9. Remove the rotor retaining push nuts from the wheel studs, if applicable.
10. It may be necessary to strike the end of the hub or the rotor with a deadblow hammer to separate the rotor from the hub.



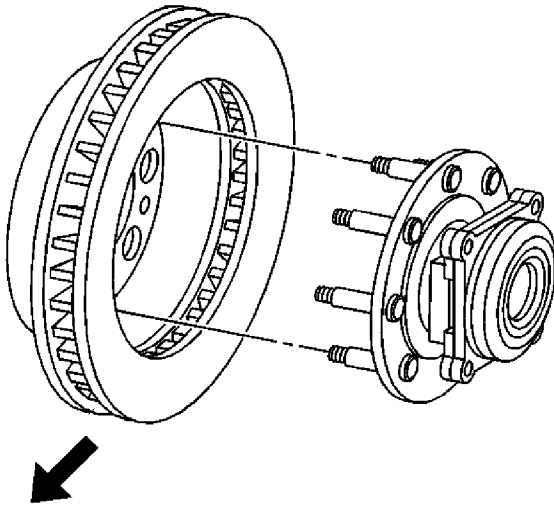
11. Remove the rotor.
12. If the rotor is difficult to remove due to corrosion in the hub area use the following procedure to remove the rotor, 25 and 35 series only.
 - 12.1. Clean all the surface areas and the threaded holes of contamination.
 - 12.2. Generously apply penetrating oil or the equivalent to the hub/rotor area.
 - 12.3. Insert two M10 x 1.5 bolts or jack screws into the threaded holes of the rotor.
 - 12.4. Tighten both bolts evenly to force the rotor from the hub.

Installation Procedure

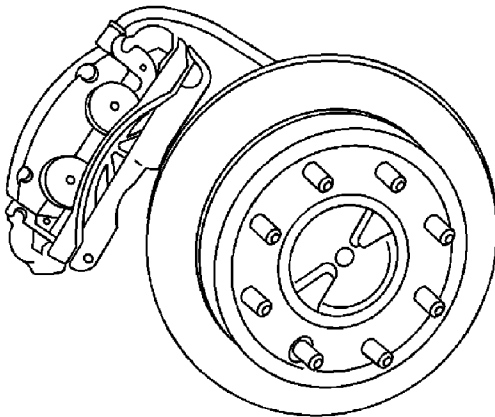
Note: Whenever the brake rotor has been separated from the hub/axle flange, any rust or contaminants should be cleaned from the hub/axle flange and the brake rotor mating surfaces. Failure to do this may result in excessive assembled lateral runout (LRO) of the brake rotor, which could lead to brake pulsation.

1. Use the [J 42450-A](#) to clean all rust and contaminants from the mating surface of the hub flange.
2. Use the [J 41013](#) to clean all rust and contaminants from the inside diameter of the hat section of the brake rotor to prevent any foreign material from getting between the brake rotor and the hub flange.
3. Inspect the mating surfaces of the hub/axle flange and the rotor to ensure that there are no foreign particles or debris remaining.

Note: If the rotor was removed using the jack screw method you must ensure that the hub flange is free of nicks or marks caused by this procedure. Remove all raised nicks or marks before installing the rotor.



4. Align the rotor to its original position on the hub (if applicable) and install the rotor.
5. If the brake rotor was removed and installed as part of a brake system repair, measure the assembled lateral runout (LRO) of the brake rotor to ensure optimum performance of the disc brakes. Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).
6. If the brake rotor assembled LRO measurement exceeds the specification, bring the LRO to within specifications. Refer to [Brake Rotor Assembled Lateral Runout Correction](#).

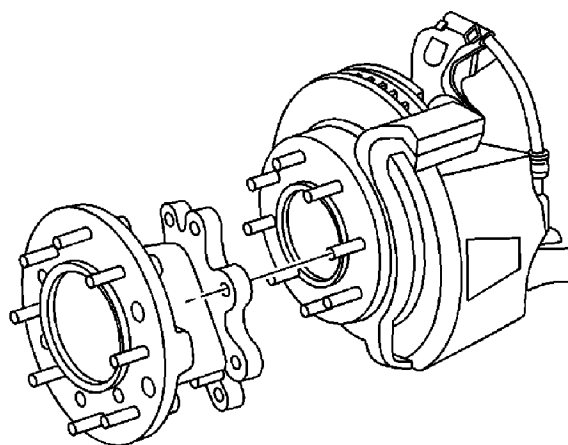


7. Install the caliper and caliper bracket assembly.
8. Perform the following procedure before installing the brake caliper bracket mounting bolts.
 - 8.1. Remove all traces of the original adhesive patch.
 - 8.2. Clean the threads of the bolt with brake parts cleaner or the equivalent and allow to dry.
 - 8.3. Apply threadlocker GM P/N 12345493 (Canadian P/N 10953488) to the threads of the

bolt.

Caution: Refer to [Fastener Caution](#) in the Preface section.

9. Install the caliper bracket mounting bolts.
 - JH5: Tighten the bolts to **175 N·m (129 lb ft)**.
 - JH6, JH7: Tighten the bolts to **300 N·m (221 lb ft)**.



10. Install the front wheel hub extension (dual wheel vehicles only).
 - 10.1. Insert a drift or large screwdriver through the brake caliper into one of the brake rotor vanes in order to prevent the rotor from turning.
 - 10.2. Align and install the front wheel hub extension to the original position on the hub.

Note: Follow the same tightening sequence for the front wheel hub extension that is used on an eight lug wheel. Refer to [Tire and Wheel Removal and Installation](#).

- 10.3. Install the front wheel hub extension nuts and tighten to **130 N·m (96 lb ft)**.
11. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
12. Lower the vehicle.
13. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
14. Slowly release the brake pedal.
15. Wait 15 seconds, then repeat steps 13-14 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
16. Fill the master cylinder reservoir to the proper level with clean brake fluid. Refer to [Master Cylinder Reservoir Filling](#).

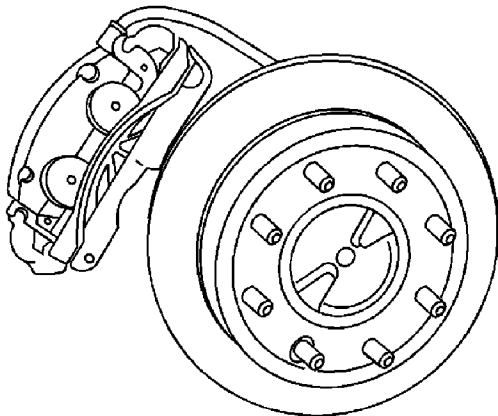
Rear Brake Rotor Replacement (With Single Rear Wheel)

Special Tools

- [J 2619-01](#) Slide Hammer With Adapter
- [J 41013](#) Rotor Resurfacing Kit
- [J 42450-A](#) Wheel Hub Resurfacing Kit
- [J-46277](#) Rotor Removal Tool

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Removal Procedure

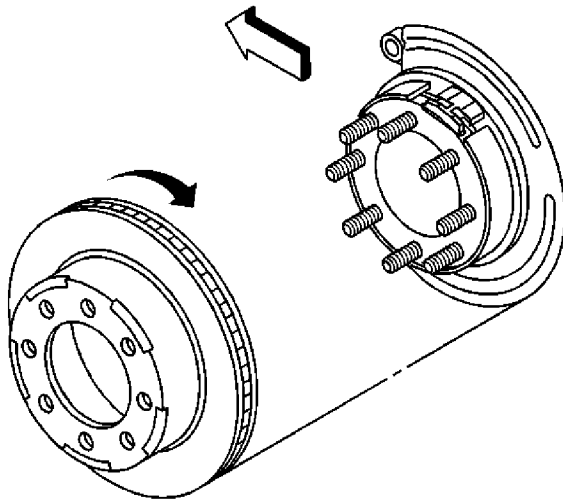


1. Release the park brake.
2. Raise and suitably support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
4. Mark the relationship of the rotor to the hub.
5. Install a C-clamp over the body of the brake caliper, with the C-clamp ends against the rear of the caliper body and the outboard disc brake pad.
6. Slowly tighten the C-clamp until the pistons are pushed into the caliper bores enough to remove the caliper from the pads.
7. Remove the C-clamp from the caliper.
8. Remove the brake caliper bracket mounting bolts.

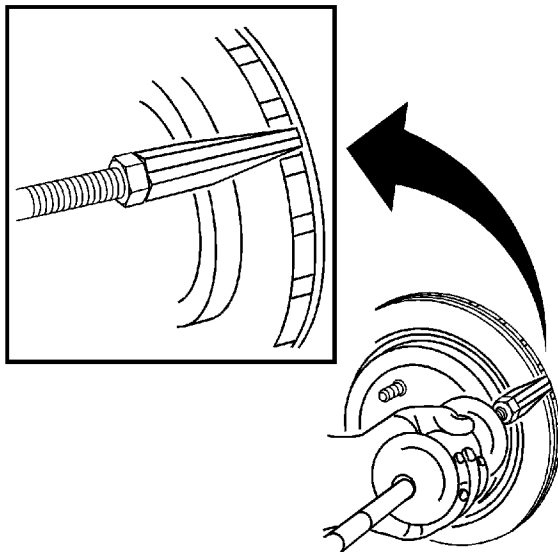
Caution: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mounting. Failure to do so may result in damage to the caliper or other components.

support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

9. Remove the brake caliper and brake caliper bracket as an assembly and support with heavy mechanic's wire or equivalent. DO NOT disconnect the hydraulic brake flexible hose from the caliper.
10. Remove the rotor retaining push nuts from the wheel studs, if applicable.
11. It may be necessary to strike the end of the hub or the rotor with a deadblow hammer to separate the rotor from the hub.



12. Remove the brake rotor. Do not force the rotor off. If the rotor is difficult to remove, ease it off by gently rotating it as you pull outward.



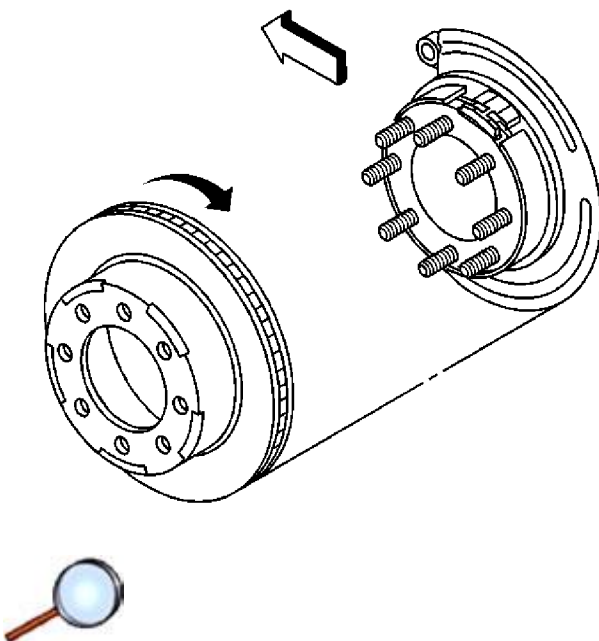
13. If the brake rotor cannot be removed perform the following:
 - 13.1. Assemble the [J-46277](#) to the [J 2619-01](#).

- 13.2. Insert the [J-46277](#) between the rotor friction surfaces in the vent section of the rotor.
DO NOT place the [J-46277](#) on the rotor friction surface.
- 13.3. Using the [J-46277](#) and the [J 2619-01](#) , remove the rotor from the hub assembly.
- 13.4. Inspect the park brake components for the following conditions:
 - Bent or broken hold down spring
 - Broken, cracked or worn brake shoe lining
 - Bent or damaged brake shoe
 - Worn, bent or damaged backing plate
- 13.5. If any of these conditions are found replace the affected parts.

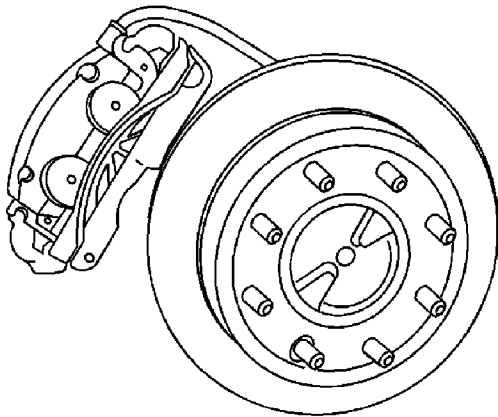
Installation Procedure

Note: Whenever the brake rotor has been separated from the hub/axle flange, any rust or contaminants should be cleaned from the hub/axle flange and the brake rotor mating surfaces. Failure to do this may result in excessive assembled lateral runout (LRO) of the brake rotor, which could lead to brake pulsation.

1. Use the [J 42450-A](#) to clean all rust and contaminants from the mating surface of the hub flange.
2. Use the [J 41013](#) to clean all rust and contaminants from the inside diameter of the hat section of the brake rotor to prevent any foreign material from getting between the brake rotor and the hub flange.
3. Inspect the mating surfaces of the hub/axle flange and the rotor to ensure that there are no foreign particles or debris remaining.
4. Align the rotor to its original position on the hub, if applicable, and install the rotor.
5. If the brake rotor was removed and installed as part of a brake system repair, measure the assembled lateral runout (LRO) of the brake rotor to ensure optimum performance of the disc brakes. Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).
6. If the brake rotor assembled LRO measurement exceeds the specification, bring the LRO to within specifications. Refer to [Brake Rotor Assembled Lateral Runout Correction](#).



7. Install the rotor by slowly turning the rotor while pushing the rotor towards the axle.



8. Install the caliper and the bracket as an assembly to the vehicle.
9. Perform the following procedure before installing the caliper bracket mounting bolts.
 - 9.1. Remove all traces of the original adhesive patch.
 - 9.2. Clean the threads of the bolt with brake parts cleaner or the equivalent and allow to dry.
 - 9.3. Apply threadlocker GM P/N 12345493 (Canadian P/N 10953488) to the threads of the bolt.

Caution: Refer to [Fastener Caution](#) in the Preface section.

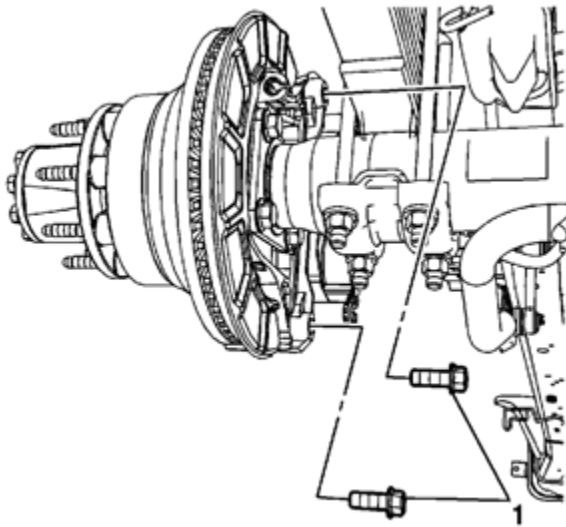
10. Install the caliper bracket mounting bolts.
 - JH5: Tighten the bolts to **200 N·m (148 lb ft)**.
 - JH6, JH7: Tighten the bolts to **165 N·m (123 lb ft)**.
11. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
12. Lower the vehicle.
13. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
14. Slowly release the brake pedal.
15. Wait 15 seconds, then repeat steps 13-14 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
16. Fill the master cylinder reservoir to the proper level with clean brake fluid. Refer to [Master Cylinder Reservoir Filling](#).

Rear Brake Rotor Replacement (With Dual Rear Wheel) Removal Procedure

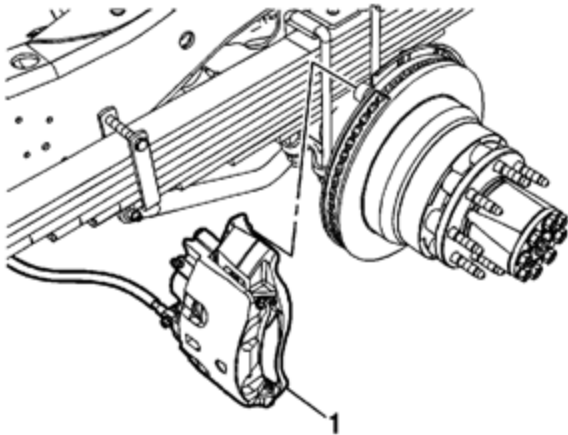
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).

Note: Do not remove the brake caliper guide pins unless replacement is required.

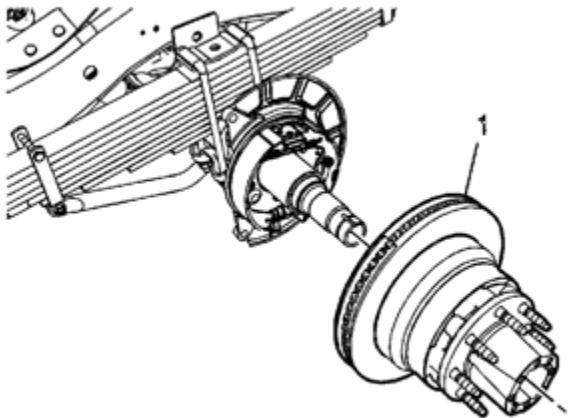


3. Remove the brake caliper bracket bolts (1).

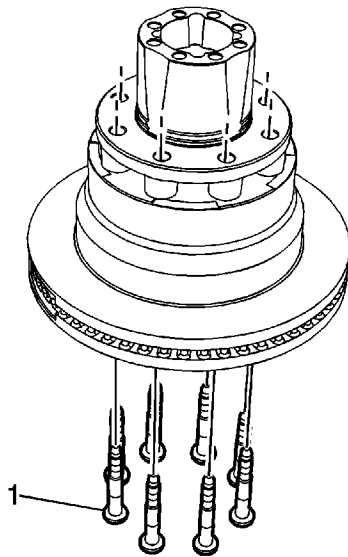


4. Remove the brake caliper and bracket assembly (1) and support with heavy mechanics wire or equivalent.
5. Remove the rear axle shaft and hub. Refer to [Rear Axle Hub, Bearing, Cup, and/or Seal Replacement](#).

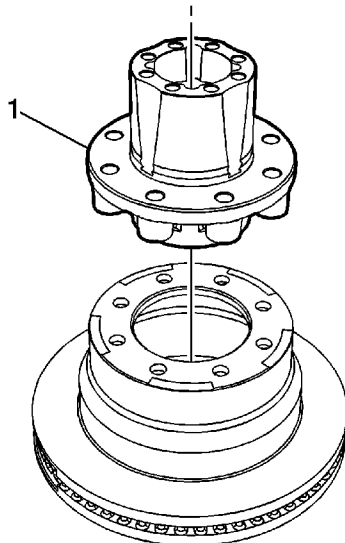
It is not necessary to remove the bearings and cups from the hub unless replacement is required.



6. Remove the brake rotor and hub assembly (1) from the rear axle.

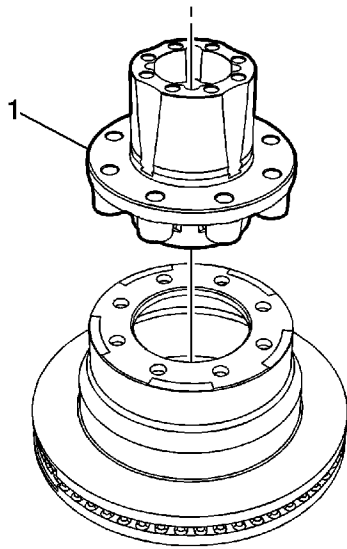


7. Mark the relationship of the hub to the rotor.
8. Using a hydraulic press, press the wheel studs (1) from the hub and rotor assembly.

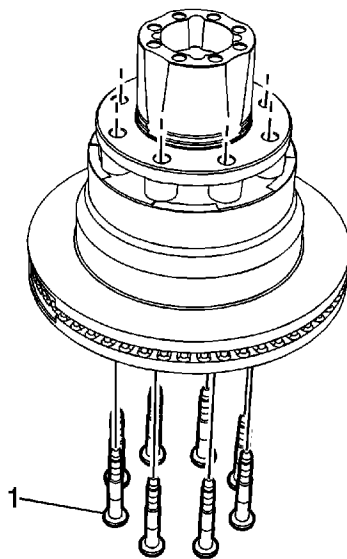


9. Separate the hub (1) from the brake rotor.
10. Using a stiff brush, clean any loose debris and corrosion from the mating surfaces of the brake rotor and the rear axle hub.

Installation Procedure



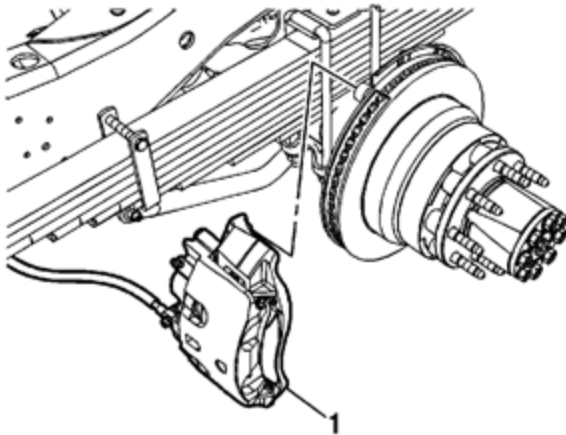
1. Install the hub (1) to the brake rotor.



2. Install the rear axle hub to the brake rotor.

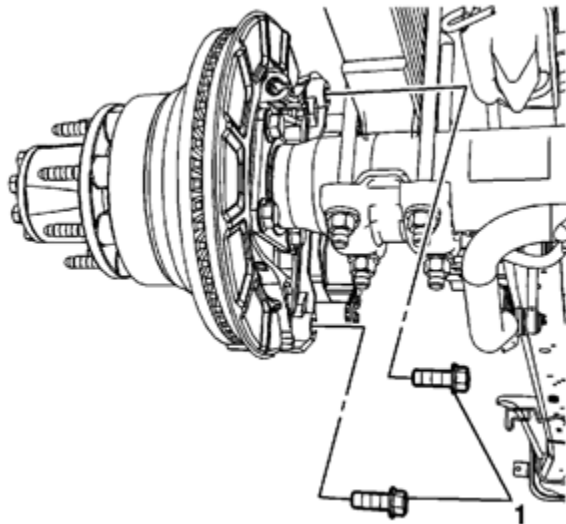
Align the matchmarks on the rear axle hub to the brake rotor.

3. Using a hydraulic press, press the wheel studs (1) in the hub and rotor assembly.
4. Prepare the brake caliper bracket bolts and the rear axle threaded holes for assembly.
 - Clean the brake caliper bracket bolts of any threadlocking residue
 - Clean the rear axle threaded holes of any threadlocking residue with denatured alcohol and allow to dry
5. Apply threadlocker GM P/N 89021297 (Canadian P/N 10953488) to 2/3 of the threaded length of the brake caliper bracket bolt.
6. Allow the threadlocker to cure approximately 10 minutes before assembly.



7. Position the brake caliper and bracket assembly (1) to the rear axle.

Caution: Refer to [Fastener Caution](#) in the Preface section.



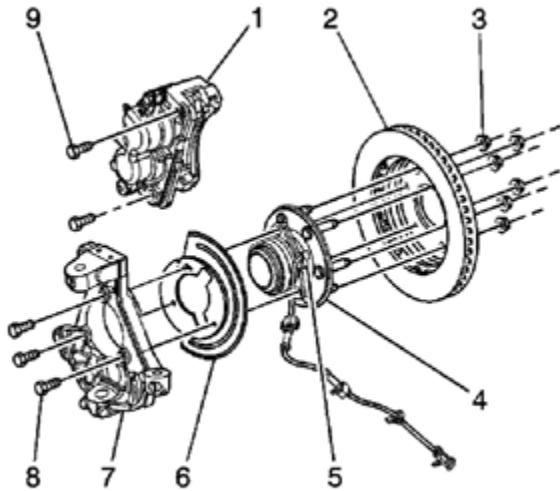
8. Install the brake caliper bracket bolts (1) and tighten to **300N·m (221 lb ft)**.
9. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).

Front Brake Shield Replacement

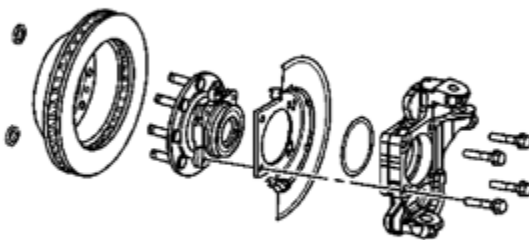
Removal Procedure

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
3. Remove the hub and bearing assembly (5). Refer to [Front Wheel Hub, Bearing, and Seal Replacement](#).



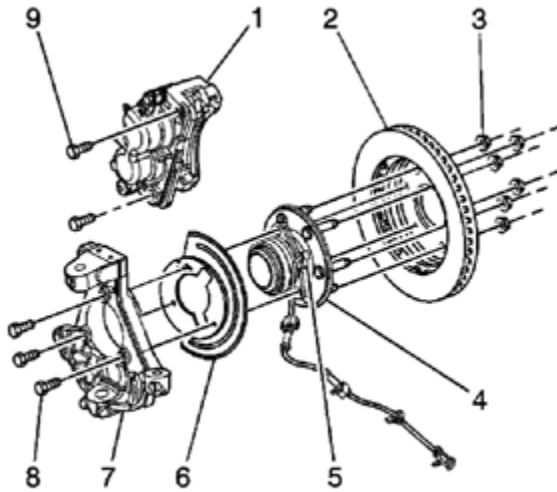
4. Remove the splash shield (6), for 15 series.



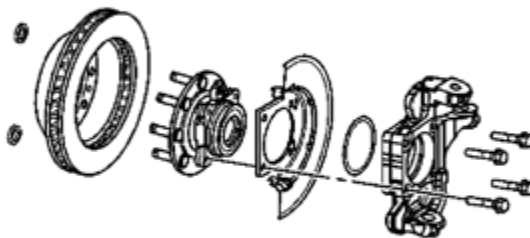


5. Remove the splash shield, for 25/35 series.

Installation Procedure



1. Install the splash shield (6), for 15 series.



2. Install the splash shield, for 25/35 series.
3. Install the hub and bearing assembly (5). Refer to [Front Wheel Hub, Bearing, and Seal Replacement](#).
4. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).

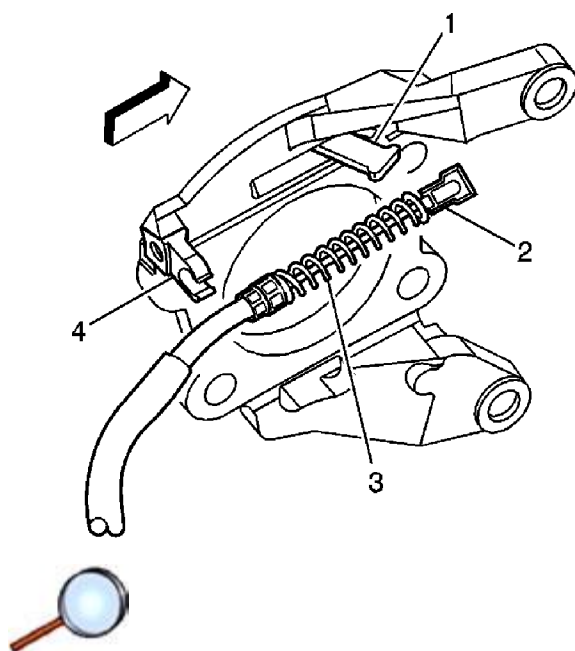
5. Remove the safety stands.
6. Lower the vehicle.

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Rear Brake Shield Replacement (Without Dual Rear Wheel)

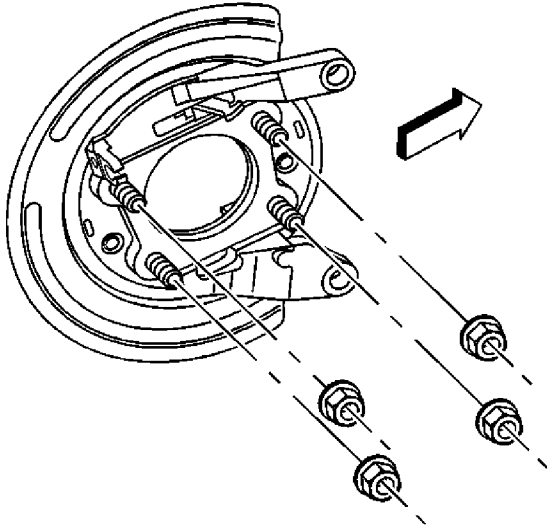
Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Removal Procedure



1. Disable the park brake cable automatic adjuster. Refer to [Parking Brake Cable Adjuster Disabling](#).
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
4. Perform the following procedure to remove the cable (2) from the rear brake shield (4):
 - 4.1. Compress the spring (3) by pushing towards the lever (1).
 - 4.2. Depress the locking tabs.
 - 4.3. Pull the cable housing out of the rear brake shield (4).
 - 4.4. Remove the cable (2) through the slot in the rear brake shield.
5. Remove the park brake cable (2) from the lever (1).
6. For the 15 and 25 series, perform the following steps:
 - 6.1. Remove the rotor. Refer to [Rear Brake Rotor Replacement](#).
 - 6.2. Remove the axle shaft. Refer to [Rear Axle Shaft Replacement](#).
7. For the 35 series with single rear wheels, perform the following steps:
 - 7.1. Remove the rotor. Refer to [Rear Brake Rotor Replacement](#).
 - 7.2. Remove the hub assembly. Refer to [Rear Axle Hub, Bearing, Cup, and/or Seal Replacement](#).
8. For the 35 series with dual rear wheels, remove the hub and rotor assembly. Refer to [Rear Axle Hub, Bearing, Cup, and/or Seal Replacement](#).

9. Remove the park brake shoe. Refer to [Parking Brake Shoe Replacement](#).

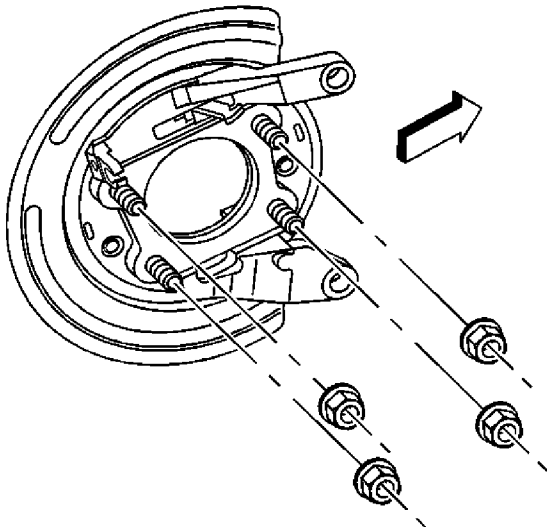


10. Remove the rear brake shield nuts.
11. Remove the rear brake shield from the axle housing flange.

Installation Procedure

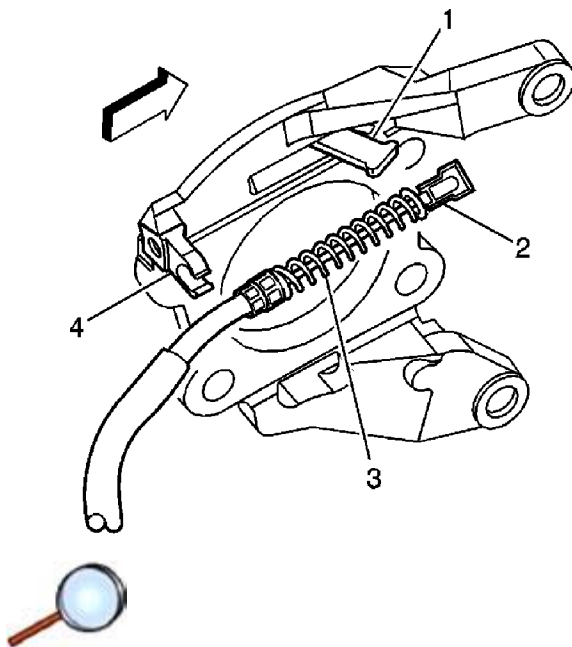
1. Install the rear brake shield to the axle housing flange.

Caution: Refer to [Fastener Caution](#) in the Preface section.



2. Install the rear brake shield nuts.

- Without dual rear wheels--Tighten the rear brake shield bolts to **135 N·m (100 lb ft)**.
 - With dual rear wheels--Tighten the rear brake shield bolts to **160 N·m (118 lb ft)** plus 30 degrees.
3. Install the park brake shoe. Refer to [Parking Brake Shoe Replacement](#).
 4. For the 15 and 25 series, perform the following steps:
 - 4.1. Install the axle shaft. Refer to [Rear Axle Shaft Replacement](#).
 - 4.2. Install the rotor. Refer to [Rear Brake Rotor Replacement](#).
 5. For the 35 series with single rear wheels, perform the following steps:
 - 5.1. Install the hub assembly. Refer to [Rear Axle Hub, Bearing, Cup, and/or Seal Replacement](#).
 - 5.2. Install the rotor. Refer to [Rear Brake Rotor Replacement](#).
 6. For the 35 series with dual rear wheels, install the hub and rotor assembly. Refer to [Rear Axle Hub, Bearing, Cup, and/or Seal Replacement](#).
 7. Adjust the park brake shoe. Refer to [Parking Brake Adjustment](#).

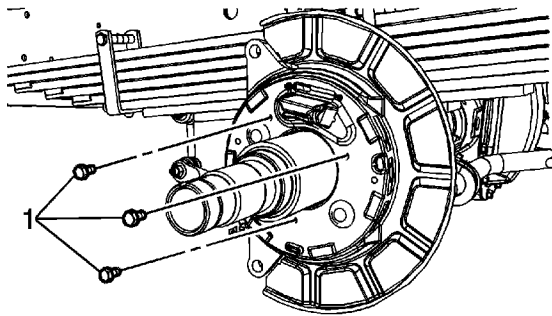


8. Install the park brake cable (2) to the lever (1).
9. Perform the following procedure to install the cable (2) to the rear brake shield (4):
 - 9.1. Compress the spring (3) by pushing towards the lever (1).
 - 9.2. Route the cable (2) through the slot in the rear brake shield.
 - 9.3. Push the cable housing into the rear brake shield (4) until the locking tabs snap into place.
10. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
11. Remove the safety stands.
12. Lower vehicle.
13. Enable the park brake cable automatic adjuster. Refer to [Parking Brake Cable Adjuster Enabling](#).

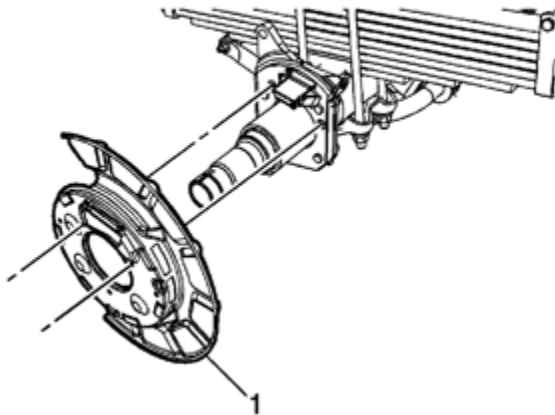
Rear Brake Shield Replacement (With Dual Rear Wheel) Removal Procedure

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

1. Disable the parking brake cable adjuster. Refer to [Parking Brake Cable Adjuster Disabling](#).
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
4. Remove the parking brake shoes. Refer to [Parking Brake Shoe Replacement](#).
5. Remove the parking brake actuator. Refer to [Parking Brake Actuator Replacement](#).



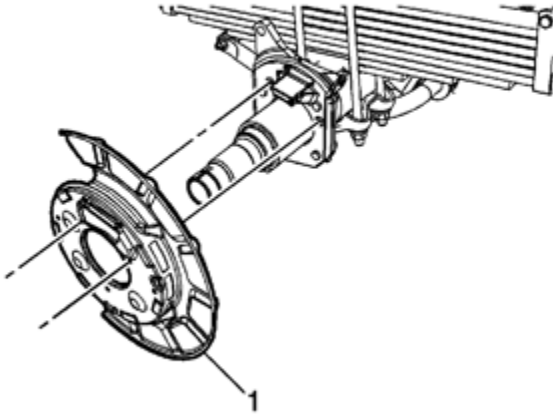
6. Remove the brake shield bolts (1).





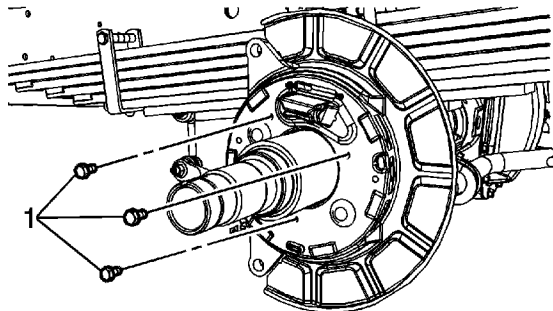
7. Remove the brake shield (1).

Installation Procedure



1. Install the brake shield (1).

Caution: Refer to [Fastener Caution](#) in the Preface section.



2. Install the brake shield bolts (1) and tighten to **10 N·m (89 lb in)**.
3. Install the parking brake actuator. Refer to [Parking Brake Actuator Replacement](#).
4. Install the parking brake shoes. Refer to [Parking Brake Shoe Replacement](#).
5. Adjust the parking brake. Refer to [Parking Brake Adjustment](#).
6. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
7. Enable the parking brake cable adjuster. Refer to [Parking Brake Cable Adjuster Enabling](#).

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Brake Rotor Assembled Lateral Runout Correction

Note:

- Brake rotor thickness variation **MUST** be checked **BEFORE** checking for assembled lateral runout (LRO). Thickness variation exceeding the maximum acceptable level can cause brake pulsation. Refer to [Brake Rotor Thickness Variation Measurement](#).
- Brake rotor assembled lateral runout (LRO) exceeding the maximum allowable specification can cause thickness variation to develop in the brake rotor over time, usually between 4,800-11,300 km (3,000-7,000 mi). Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).

Review the following acceptable methods for bringing the brake rotor assembled LRO to within specifications. Determine which method to use for the specific vehicle being repaired.

- The indexing method of correcting assembled LRO is most effective when the LRO specification is only exceeded by a relatively small amount: 0.025-0.127 mm (0.001-0.005 in). Indexing is used to achieve the best possible match of high spots to low spots between related components. Refer to [Brake Rotor Assembled Lateral Runout Correction - Indexing](#).
- The on-vehicle brake lathe method is used to bring the LRO to within specifications through compensating for LRO while refinishing the brake rotor. Refer to [Brake Rotor Assembled Lateral Runout Correction - On Vehicle Lathe](#).

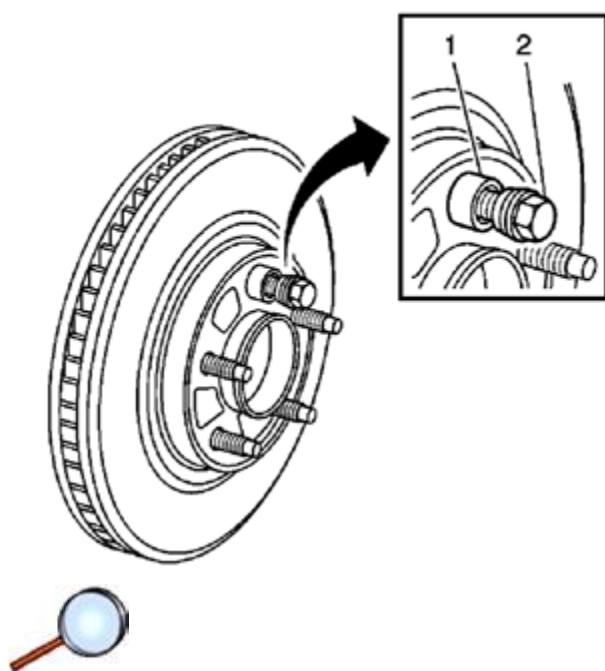
If the assembled LRO cannot be corrected using these methods, then other components must be suspected as causing and/or contributing to the LRO concern.

Brake Rotor Assembled Lateral Runout Correction - Indexing

Special Tools

- J-39544-KIT Torque-Limiting Socket Set , or equivalent
- J-45101-100 Conical Brake Rotor Washers

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

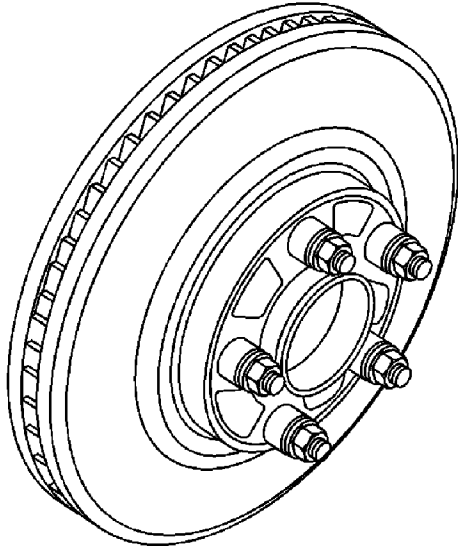


Note:

- Brake rotor thickness variation **MUST** be checked **BEFORE** checking for assembled lateral runout (LRO). Thickness variation exceeding the maximum acceptable level can cause brake pulsation. Refer to [Brake Rotor Thickness Variation Measurement](#).
- Brake rotor assembled LRO exceeding the maximum allowable specification can cause thickness variation to develop in the brake rotor over time, usually between 4,800-11,300 km (3,000-7,000 mi). Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).

1. Remove the J-45101-100 washers and the lug nuts that were installed during the assembled LRO measurement procedure.
2. Inspect the mating surface of the hub/axle flange and the brake rotor to ensure that there are no foreign particles or debris remaining.
3. Index the brake rotor in a different orientation to the hub/axle flange.
4. Hold the rotor firmly in place against the hub/axle flange and install one of the J-45101-100 washers (1) and one lug nut (2) onto the upper-most wheel stud.

5. Continue to hold the rotor secure and tighten the lug nut firmly by hand.



6. Install the remaining *J-45101-100* washers and lug nuts onto the wheel studs and tighten the nuts firmly by hand in a star-pattern.
7. Using the *J-39544-KIT* set , or equivalent, tighten the lug nuts in a star-pattern to specification, in order to properly secure the rotor. Refer to [Tire and Wheel Removal and Installation](#).
8. Measure the assembled LRO of the brake rotor. Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).
9. Compare the amount of change between this measurement and the original measurement.
10. If this measurement is within specifications, proceed to step 14.
11. If this measurement still exceeds specifications, repeat steps 1-9 until the best assembled LRO measurement is obtained.
12. Matchmark the final location of the rotor to the wheel studs if the orientation is different than it was originally.
13. If the brake rotor assembled LRO measurement still exceeds the maximum allowable specification, refer to [Brake Rotor Assembled Lateral Runout Correction](#).
14. If the brake rotor assembled LRO is within specification, install the brake caliper and depress the brake pedal several times to secure the rotor in place before removing the *J-45101-100* washers and the lug nuts.

Brake Rotor Assembled Lateral Runout Correction - On Vehicle Lathe

Special Tools

J-45101-100 Conical Brake Rotor Washers

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Note:

- Brake rotor thickness variation **MUST** be checked **BEFORE** checking for assembled lateral runout (LRO). Thickness variation exceeding the maximum acceptable level can cause brake pulsation. Refer to [Brake Rotor Thickness Variation Measurement](#).
- Brake rotor assembled LRO exceeding the maximum allowable specification can cause thickness variation to develop in the brake rotor over time, usually between 4 800-11 300 km (3,000-7,000 mi). Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).

1. Ensure that the caliper and caliper bracket that are already being supported, are clear from contacting any rotating components, such as the brake rotor.
2. Remove the J-45101-100 washers and the lug nuts that were installed during the assembled LRO measurement procedure and/or the indexing correction procedure.
3. Inspect the mounting surface of the hub/axle flange and the brake rotor to ensure that there are no foreign particles or debris remaining.
4. Set up the lathe, following the manufacturer's instructions.
5. Refinish the brake rotor, following the brake lathe manufacturer's instructions.
6. After each successive cut, inspect the brake rotor thickness. Refer to [Brake Rotor Thickness Measurement](#).
7. If at any time the brake rotor exceeds the minimum allowable thickness after refinish specification, the brake rotor must be replaced. After replacing the rotor, proceed to step 10.
8. After refinishing the brake rotor, use the following procedure in order to obtain the desired non-directional finish:
 - 8.1. Follow the brake lathe manufacturer's recommended speed setting for applying a non-directional finish.
 - 8.2. Using moderate pressure, apply the non-directional finish:
 - If the lathe is equipped with a non-directional finishing tool, apply the finish with 120-grit aluminum oxide sandpaper.
 - If the lathe is not equipped with a non-directional finishing tool, apply the finish with a sanding block and 150-grit aluminum oxide sandpaper.
 - 8.3. After applying a non-directional finish, clean each friction surface of the brake rotor with denatured alcohol, or an equivalent approved brake cleaner.
9. Remove the lathe from the vehicle.
10. Measure the assembled LRO of the brake rotor. Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).
11. If the brake rotor assembled LRO measurement still exceeds the maximum allowable specification, refer to [Brake Rotor Assembled Lateral Runout Correction](#).
12. If the brake rotor assembled LRO is within specification, install the brake caliper and depress the brake pedal several times to secure the rotor in place before removing the J-45101-100

washers and the lug nuts.

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Brake Rotor Refinishing

Special Tools

- J-41013 Rotor Resurfacing Kit
- J-42450-A Wheel Hub Resurfacing Kit

Warning: Refer to [Brake Dust Warning](#) in the Preface section.

Note:

- The disc brake rotors do not require refinishing as part of routine brake system service. New disc brake rotors do not require refinishing.

Do not refinish disc brake rotors in an attempt to correct the following conditions:

- Brake system noise - squeal, growl, groan
 - Uneven and/or premature disc brake pad wear
 - Superficial or cosmetic corrosion/rust of the disc brake rotor friction surface
 - Scoring of the disc brake rotor friction surface less than the maximum allowable specification
- Before refinishing a brake rotor, the rotor MUST first be checked for adequate thickness to allow the rotor to be refinished and remain above the minimum allowable thickness after refinish specification. Refer to [Brake Rotor Thickness Measurement](#).
Disc brake rotors should only be refinished if they have adequate thickness to be refinished and if one or more of the following conditions exist:
 - Thickness variation in excess of the maximum allowable specification
 - Excessive corrosion/rust and/or pitting
 - Cracks and/or heat spots
 - Excessive blueing discoloration
 - Scoring of the disc brake rotor surface in excess of the maximum allowable specification
 - Disc brake rotors may need to be refinished as part of the process for correcting brake rotor assembled lateral runout (LRO) that exceeds the maximum allowable specification.

Note: If the vehicle is equipped with cross-drilled rotors, use a lathe with positive rake tooling. This setup requires less cutting pressure, which will result in less vibration, and a better surface finish. Also, use a vibration dampener when cutting. Otherwise, refinish according to the following instructions.

Note: Whenever the brake rotor has been separated from the hub/axle flange, clean any rust or contaminants from the hub/axle flange and the brake rotor mating surfaces. Failure to do this may result in increased assembled lateral runout (LRO) of the brake rotor, which could lead to brake pulsation.

1. Using the J-42450-A kit , thoroughly clean any rust or corrosion from the mating surface of the hub/axle flange.
2. Using the J-41013 kit , thoroughly clean any rust or corrosion from the mating surface and mounting surface of the brake rotor.

3. Inspect the mating surfaces of the hub/axle flange and the rotor to ensure that there are no foreign particles or debris remaining.
4. Mount the brake rotor to the brake lathe according to the lathe manufacturer's instructions, ensuring that all mounting attachments and adapters are clean and free of debris.
5. Ensure that any vibration dampening attachments are securely in place.
6. With the brake lathe running, slowly bring in the cutting tools until they just contact the brake rotor friction surfaces.
7. Observe the witness mark on the brake rotor. If the witness mark extends approximately three-quarters or more of the way around the brake rotor friction surface on each side, the brake rotor is properly mounted to the lathe.
8. If the witness mark does not extend three-quarters or more of the way around the brake rotor, re-mount the rotor to the lathe.
9. Following the brake lathe manufacturer's instructions, refinish the brake rotor.
10. After each successive cut, inspect the brake rotor thickness. Refer to [Brake Rotor Thickness Measurement](#).
11. If at any time the brake rotor exceeds the minimum allowable thickness after refinish specification, the brake rotor must be replaced.
12. After refinishing the brake rotor, use the following procedure in order to obtain the desired non-directional finish:
 - 12.1. Follow the brake lathe manufacturer's recommended speed setting for applying a non-directional finish.
 - 12.2. Using moderate pressure, apply the non-directional finish:
 - If the lathe is equipped with a non-directional finishing tool, apply the finish with 120-grit aluminum oxide sandpaper.
 - If the lathe is not equipped with a non-directional finishing tool, apply the finish with a sanding block and 150-grit aluminum oxide sandpaper.
 - 12.3. After applying a non-directional finish, clean each friction surface of the brake rotor with denatured alcohol, or an equivalent approved brake cleaner and wipe each friction surface using a clean shop towel to remove metal particles remaining from machining. Repeat the cleaning process if necessary to remove all metal particles.
13. Remove the brake rotor from the brake lathe.
14. Measure the assembled LRO of the brake rotor to ensure optimum performance of the disc brakes. Refer to [Brake Rotor Assembled Lateral Runout Measurement](#).
15. If the brake rotor assembled LRO measurement exceeds the specification, bring the LRO to within specifications. Refer to [Brake Rotor Assembled Lateral Runout Correction](#).